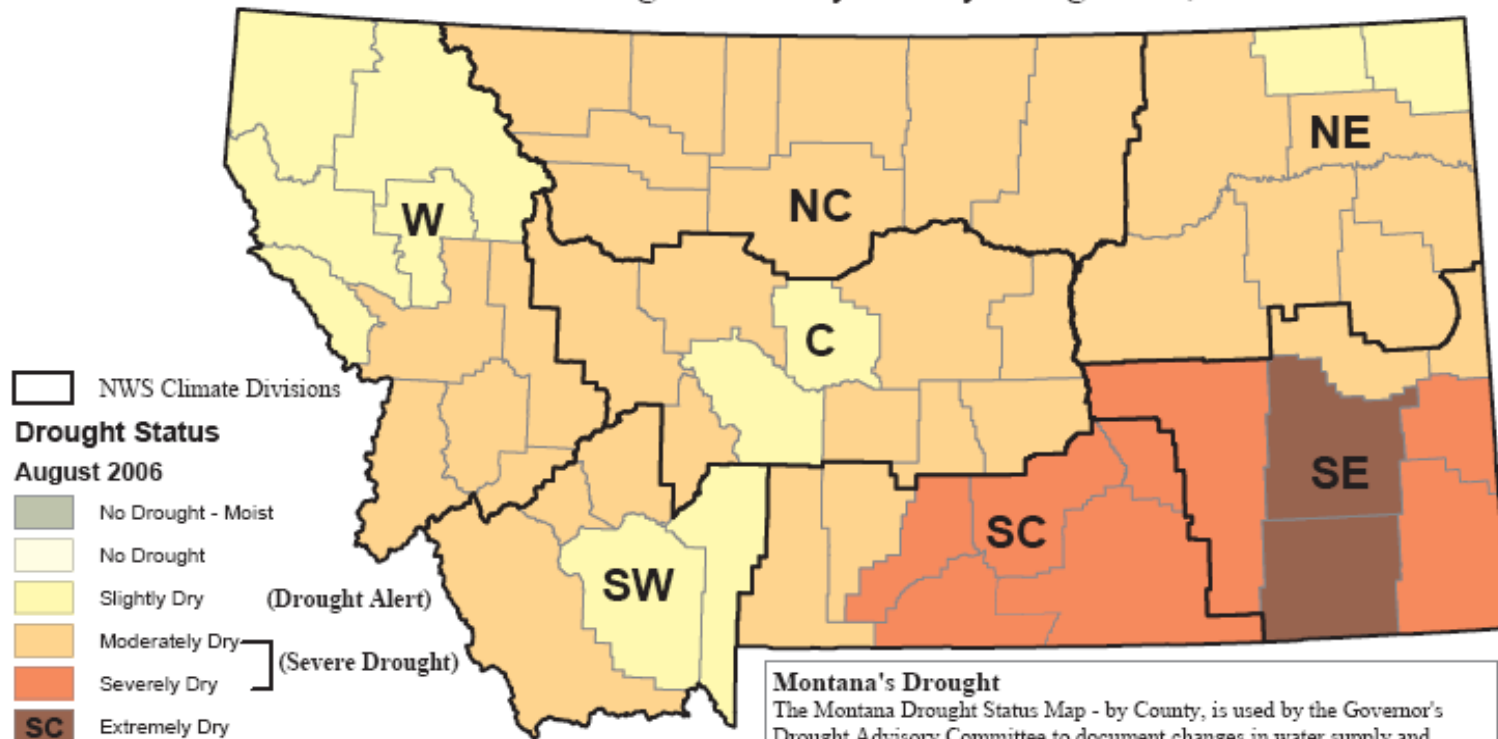


Montana Drought Status - August

Montana Drought Status by County - August 17, 2006



Drought Alert - Governor's Drought Advisory Committee strongly encourages local officials to convene local drought committees.

Severe Drought - Local officials should have local drought planning efforts underway or should reconvene the local drought committee at the earliest opportunity.

For recommended responses, see the Drought Response Plan.



<http://nr.is.state.mt.us/drought/>

Montana's Drought

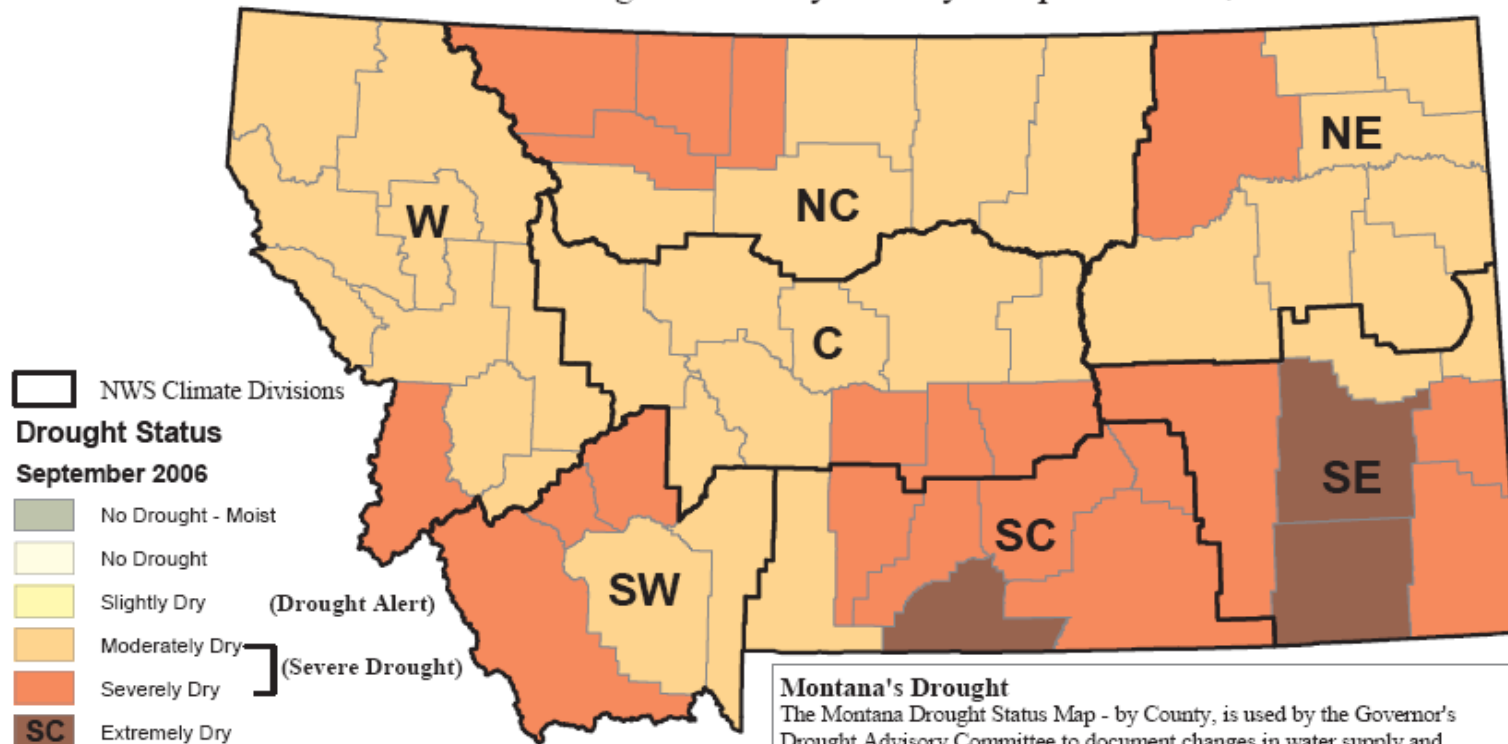
The Montana Drought Status Map - by County, is used by the Governor's Drought Advisory Committee to document changes in water supply and moisture conditions on a monthly basis and to alert counties so timely responses are possible. The descriptive categories of the Drought Status map correspond with known and anticipated levels of economic hardship on water uses and moisture dependence due to drought. Recovery from up to six consecutive years of severe drought conditions continues across large areas of Montana. High temperatures, declining streamflow, and wildfire are common in any given summer in Montana and do not necessarily indicate the presence of drought.

For more information regarding the determination of the drought status or the activities of the Drought Advisory Committee visit:

<http://www.dnrc.state.mt.us/Drought/Index.html>

Montana Drought Status - September

Montana Drought Status by County - September 19, 2006



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<http://nris.state.mt.us/drought/>

Montana's Drought

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Governor's Drought Advisory Committee Meeting

September 21, 2006

National Weather Service

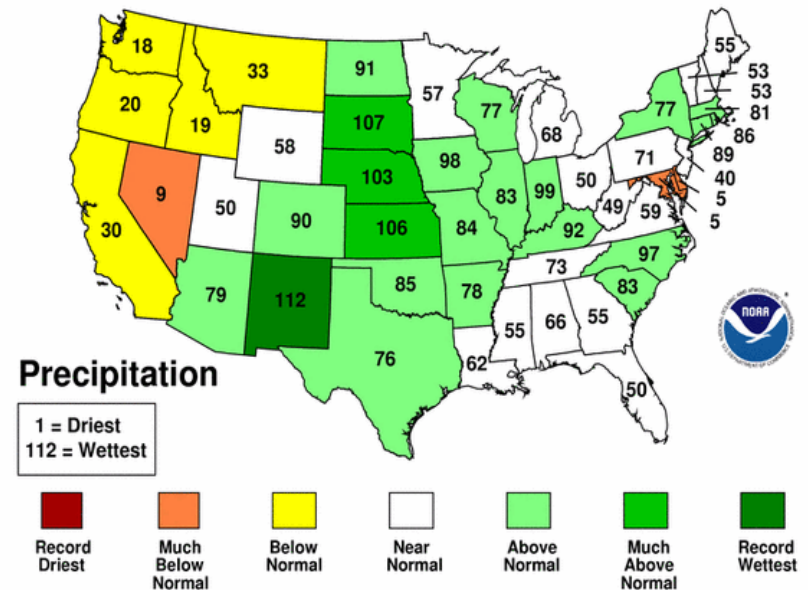
Gina Loss



National Climatic Data Center/NESDIS/NOAA



National Climatic Data Center/NESDIS/NOAA



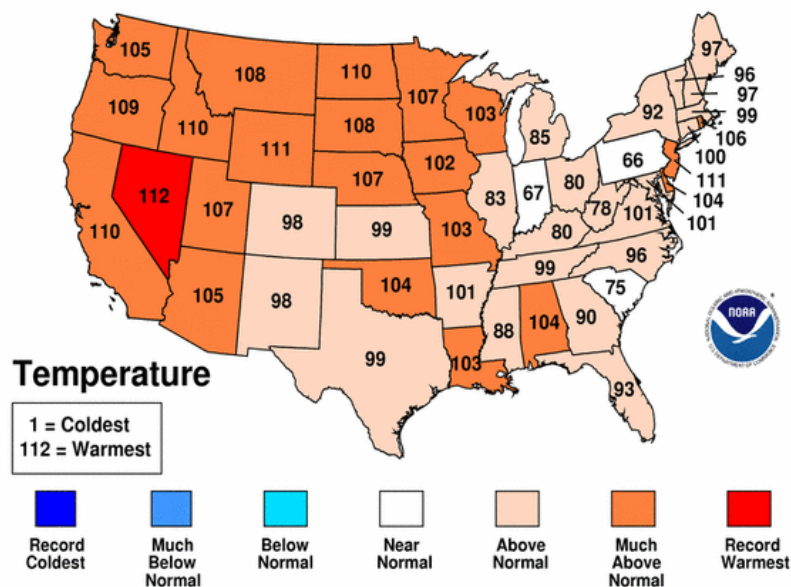


Summer 2006

Hot and dry!

June-August 2006 Statewide Ranks

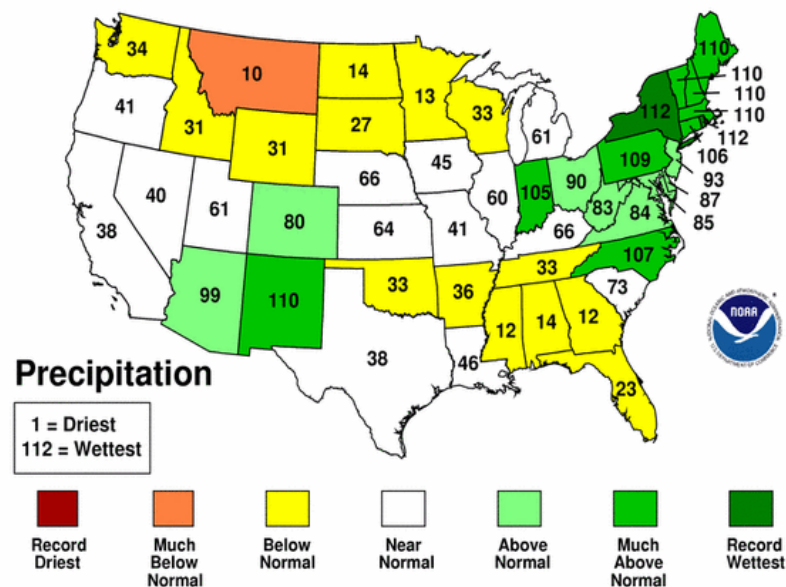
National Climatic Data Center/NESDIS/NOAA



- 5th warmest summer of 112 years
- 10th driest

June-August 2006 Statewide Ranks

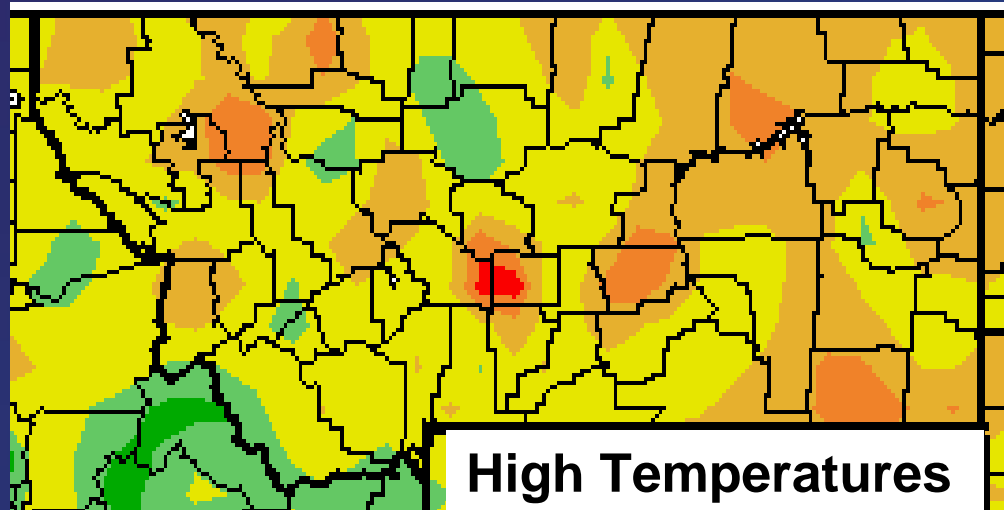
National Climatic Data Center/NESDIS/NOAA



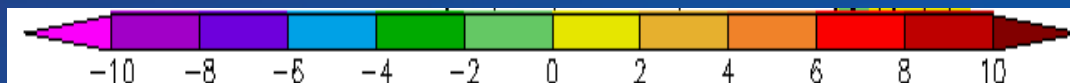
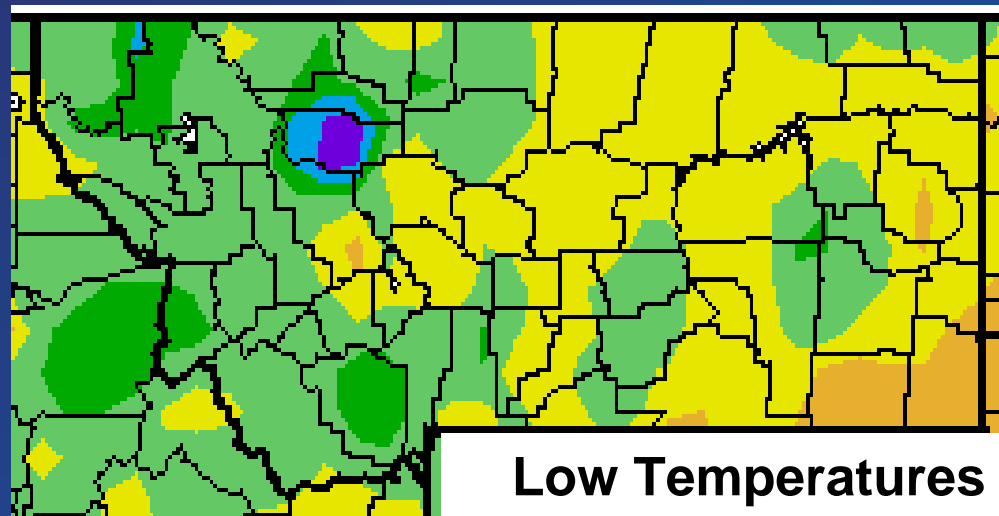


August Temperature Anomalies

August 1 – August 30, 2006



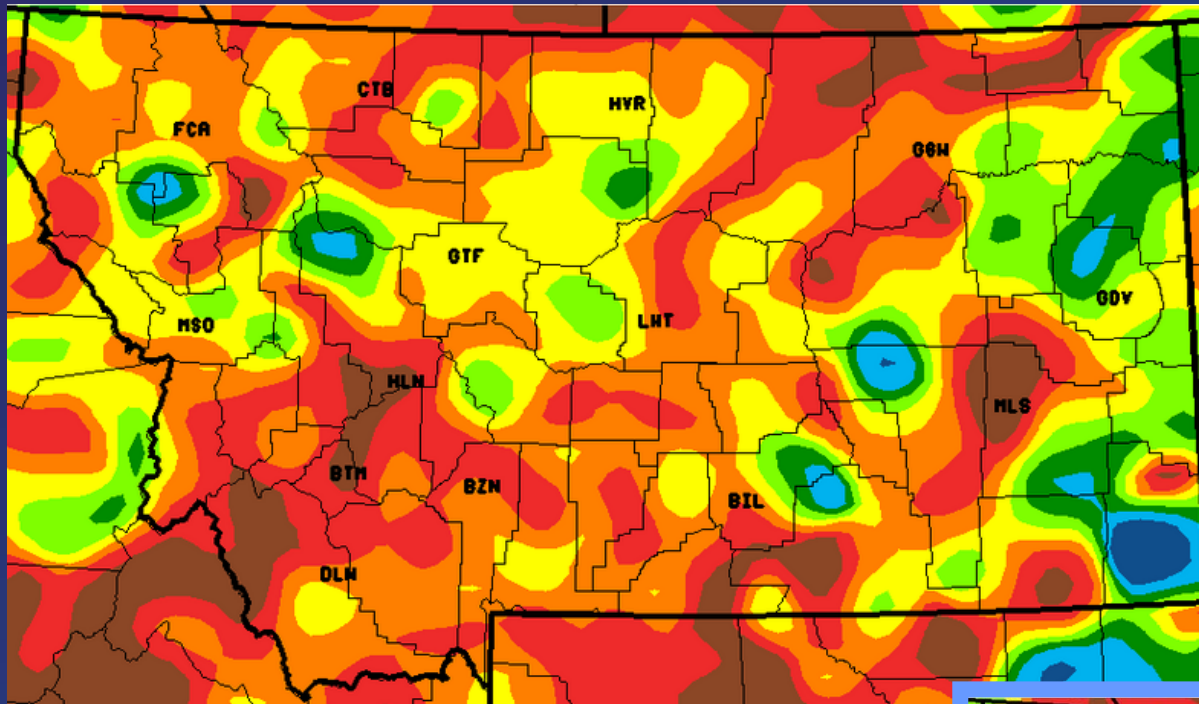
- **Highs**
 - *West and central mostly near normal*
 - *East 2 to 6 degrees above normal*
- **Lows**
 - *Near normal statewide*
 - Isolated exceptions



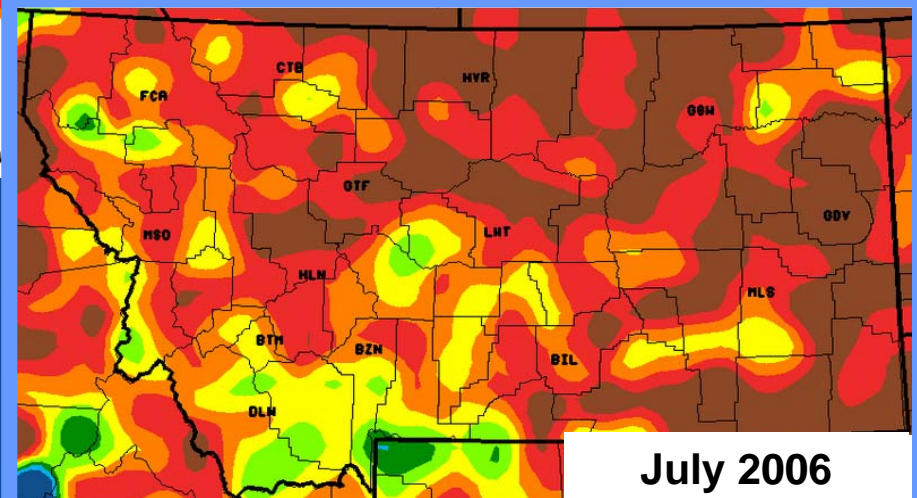
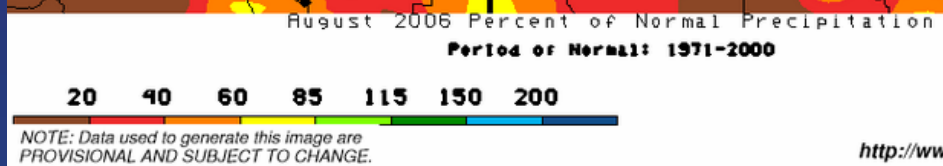


Percent of Normal Precipitation

August 2006



- Virtually all of Montana below average
- Approximately half the state less than 60% of average
- Only isolated areas near normal
 - *Mainly near the mountains and in the east*



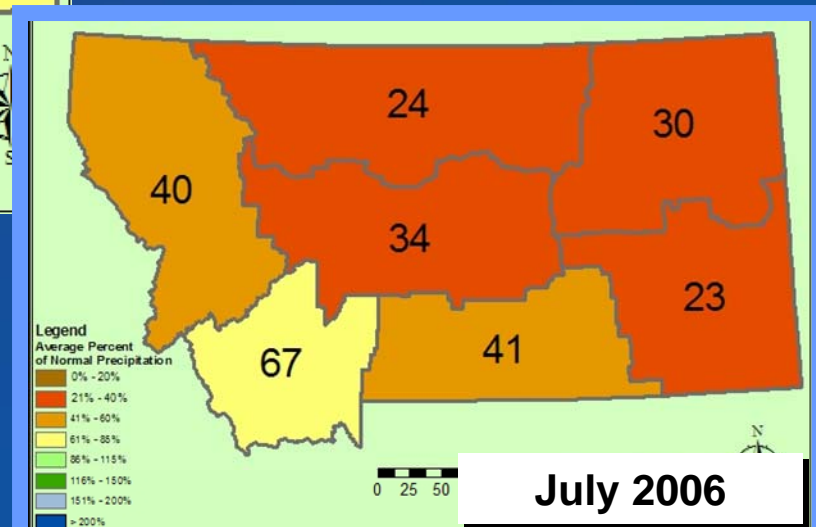
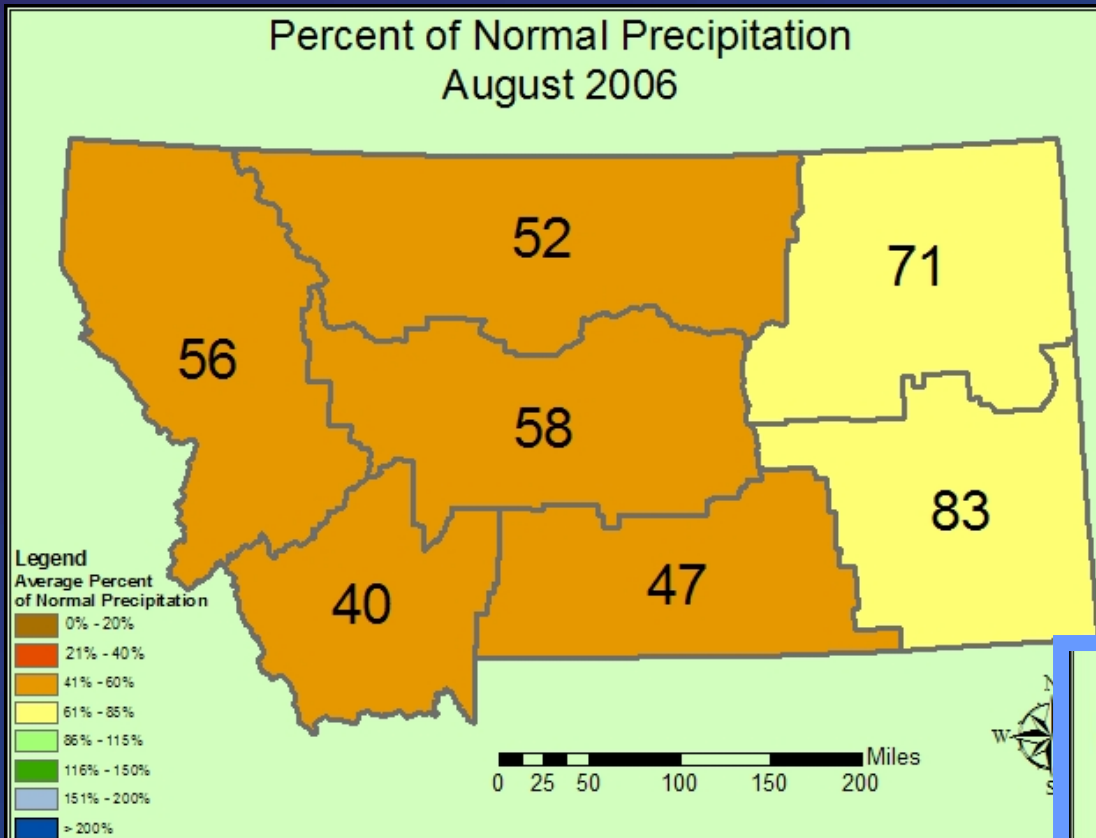
July 2006



Percent of Normal Precipitation

By Climate Division ~ August 2006

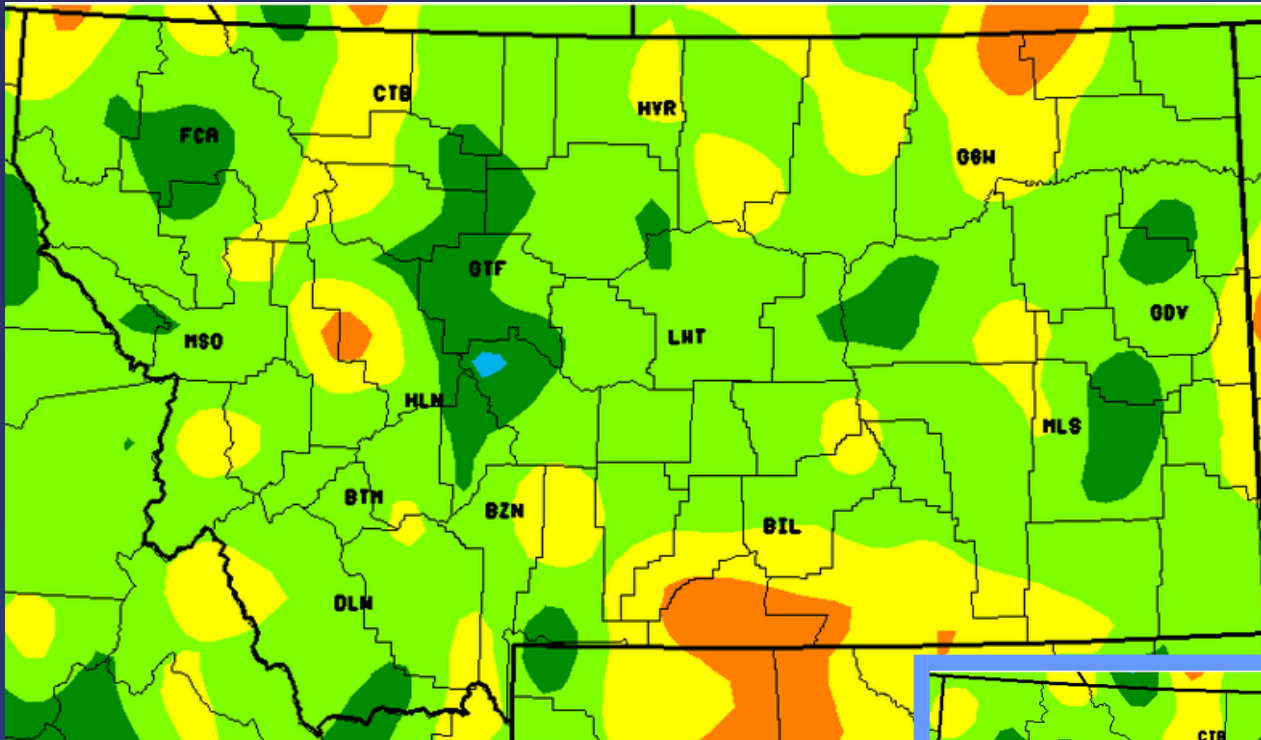
- All climate divisions below normal
- Five divisions well below normal
 - *West*
 - *Southwest*
 - *North central*
 - *Central*
 - *South central*





Percent of Normal Precipitation Water Year 2006

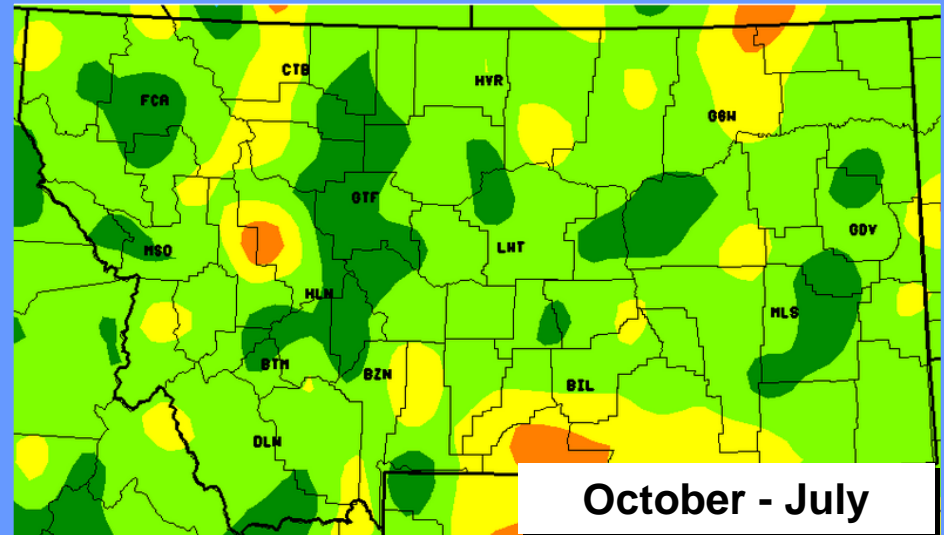
- October – August
- Most of Montana still near normal
 - Only small pockets above normal
- Areas below normal continue to expand



Oct 2005-Aug 2006 Percent of Normal Precip
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

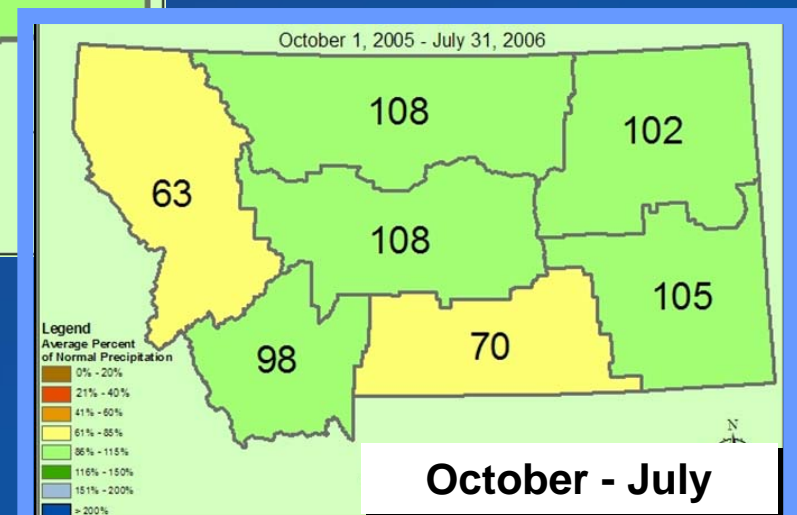
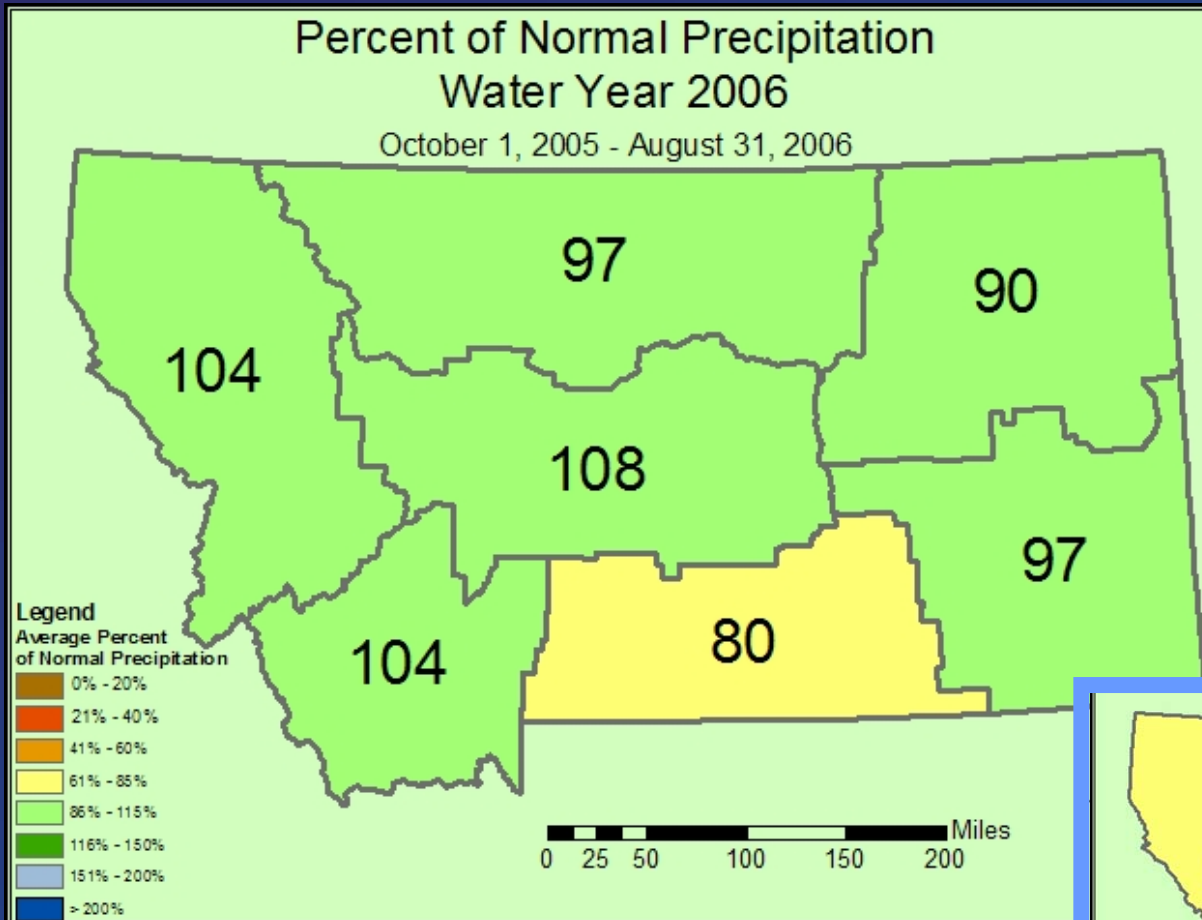


October - July



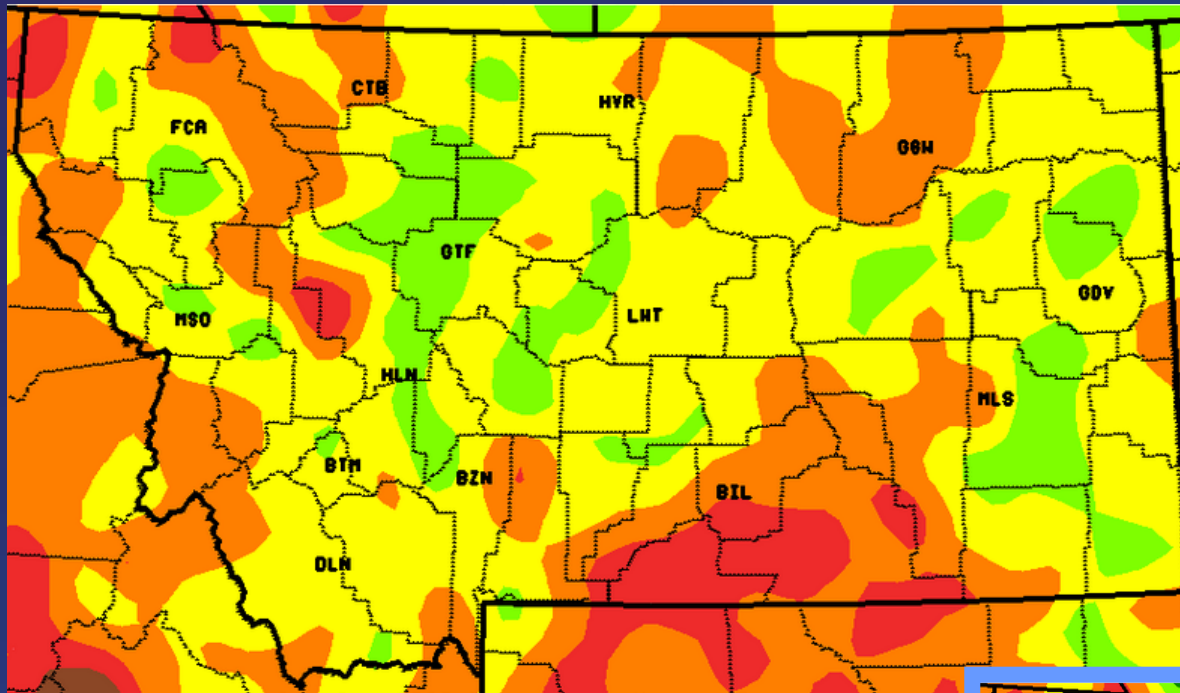
Percent of Normal Precipitation By Climate Division ~ Water Year 2006

- October – August
- Most divisions 'near normal'
- One division 'below normal'
– *South central*





Percent of Normal Precipitation Crop Year 2006



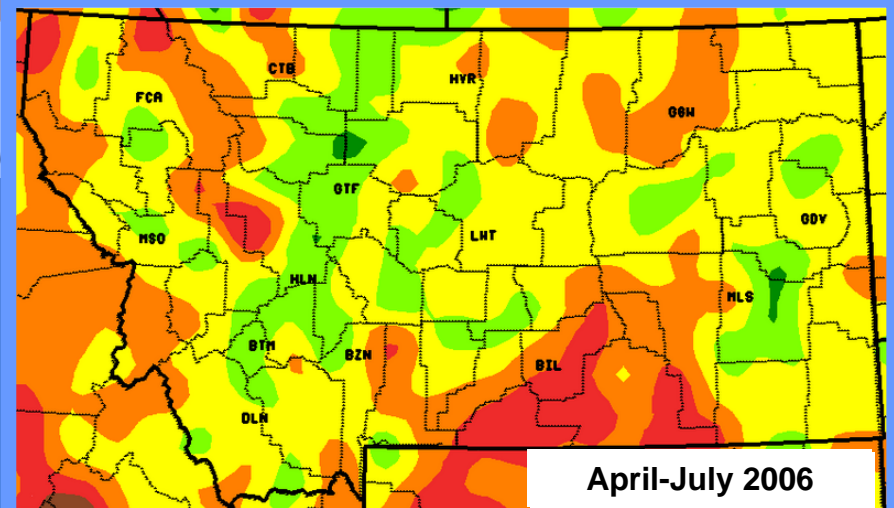
Apr-Aug 2006 Percent of Normal Precipitation
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.w>

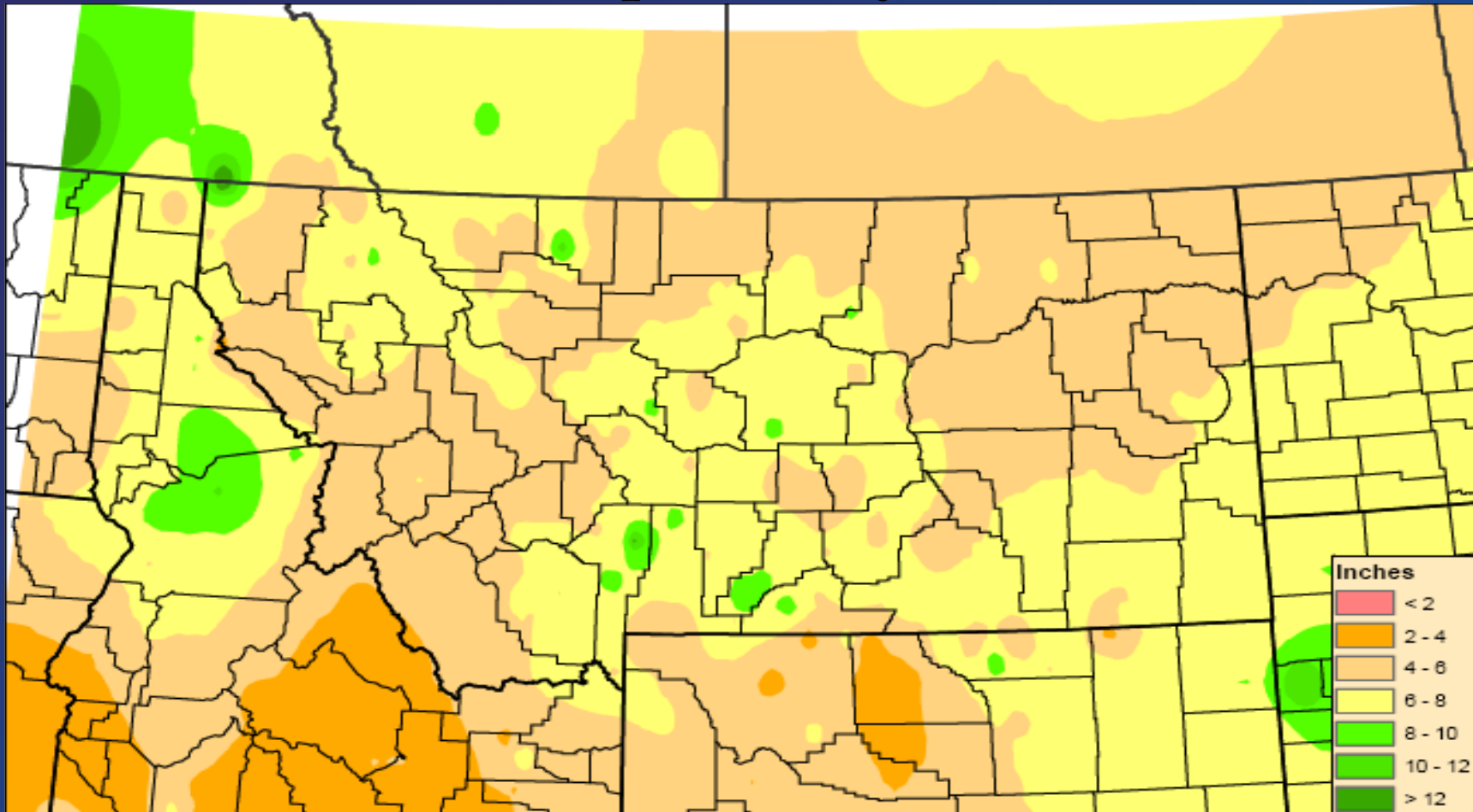
- April – August
- Most of Montana below to well below average
 - Large areas less than 40% of normal



April-July 2006



Crop Year Average Precipitation April – July

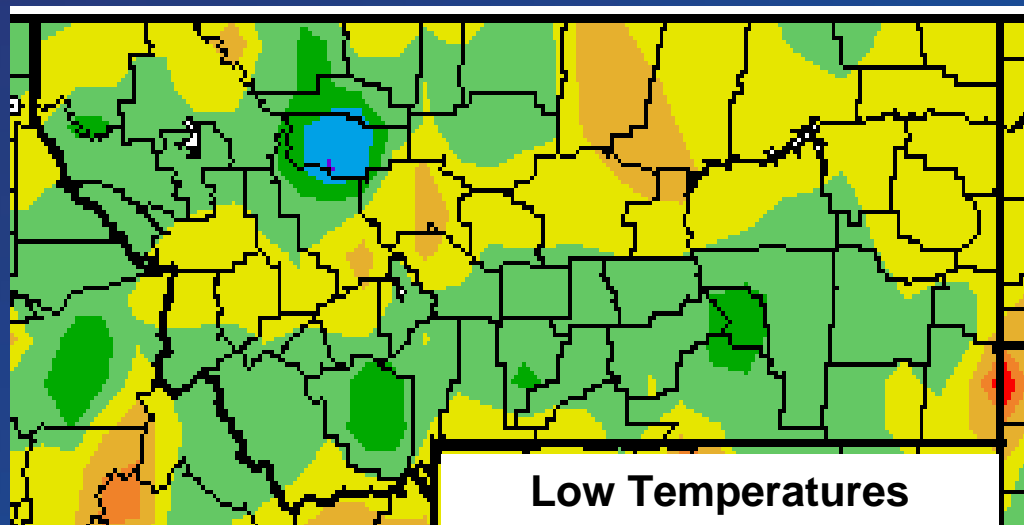
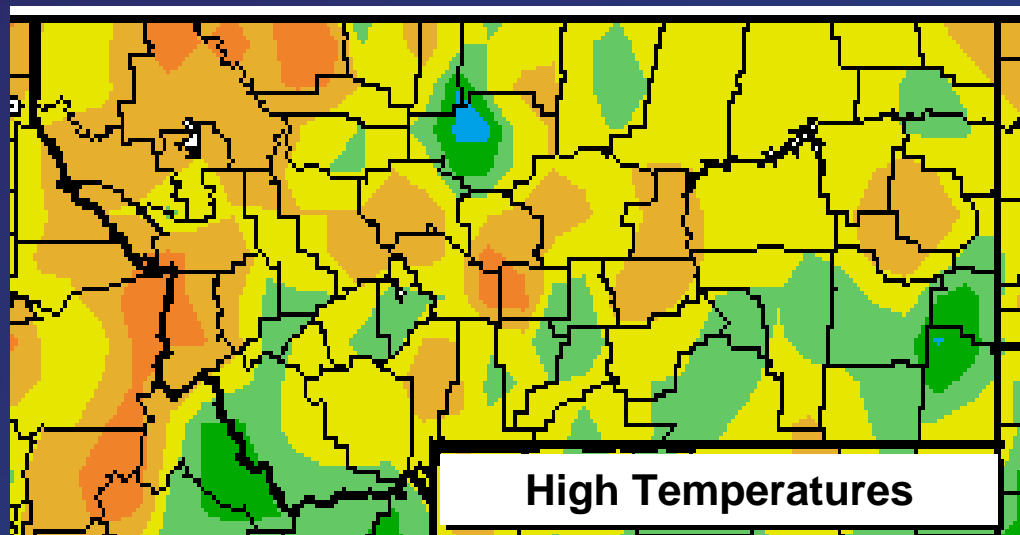


- 💧 Virtually all of Montana receives less than 8 inches of precipitation during the April – July period
- 💧 A large portion of the state receives less than 6 inches



Departure from Average Temperature

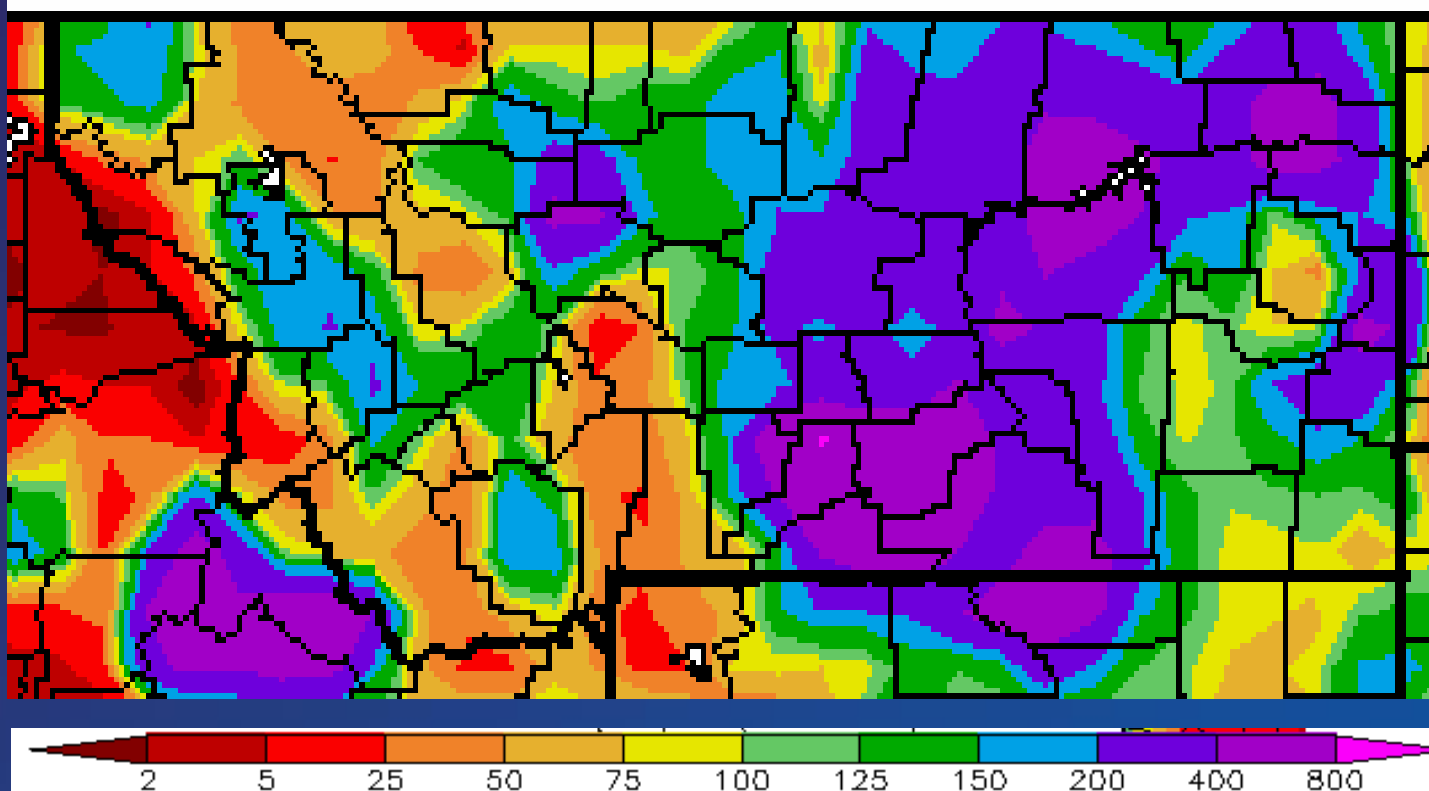
September 1 – 18



- Temperatures generally near normal
 - Highs – 2 to 6 degrees above normal west and isolated areas central and east*
 - Lows – Mostly near normal*



Percent of Average Precipitation September 1 - 18, 2006



- 💧 Mid-month storm brought widespread precipitation to the state... especially central and east
 - *Large areas at 200% or more of normal*
- 💧 West and southwest drier
 - *Large areas at less than 50% of normal*



Precipitation Totals

September and Water Year 2006

| | SEPTEMBER 1 - 18 | | | | WATER YEAR TO DATE | | | |
|--------------------------|------------------|--------------|-------------|--------------|--------------------|--------------|-------------|--------------|
| | ACTUAL PCPN | NRML PCPN | +/- NRML | % OF NRML | ACTUAL PCPN | NRML PCPN | +/- NRML | % OF NRML |
| WESTERN MONTANA | | | | | | | | |
| BUTTE | 0.41 | 0.72 | -0.31 | 57 | 12.44 | 12.41 | 0.03 | 100 |
| KALISPELL | 0.49 | 0.72 | -0.23 | 68 | 16.96 | 16.73 | 0.23 | 101 |
| MISSOULA | 0.88 | 0.72 | 0.16 | 122 | 15.80 | 11.74 | 4.06 | 135 |
| MULLAN PASS | 0.32 | 1.02 | -0.70 | 31 | 44.61 | 45.18 | -0.57 | 99 |
| SOUTHWEST MONTANA | | | | | | | | |
| BIG SKY | 0.57 | 1.16 | -0.59 | 49 | 22.23 | 19.75 | 2.48 | 113 |
| BOULDER | 0.83 | 0.70 | 0.13 | 119 | 11.84 | 11.15 | 0.69 | 106 |
| BELGRADE FIELD | 0.49 | 0.87 | -0.38 | 56 | 13.45 | 14.15 | -0.70 | 95 |
| BOZEMAN MSU | 0.54 | 1.08 | -0.54 | 50 | 20.46 | 18.57 | 1.89 | 110 |
| DILLON AIRPORT | 0.36 | 0.61 | -0.25 | 59 | 9.03 | 9.58 | -0.55 | 94 |
| ENNIS | 1.00 | 0.72 | 0.28 | 139 | 12.91 | 13.11 | -0.20 | 98 |
| HELENA | 0.85 | 0.71 | 0.14 | 120 | 12.30 | 10.88 | 1.42 | 113 |
| LAKEVIEW | 0.00 | 1.13 | -1.13 | 0 | 9.89 | 18.77 | -8.88 | 53 |
| ROGERS PASS 9 NNE | 0.61 | 1.01 | -0.40 | 60 | 15.50 | 17.17 | -1.67 | 90 |
| TOWNSEND | 0.51 | 0.65 | -0.14 | 78 | 11.76 | 10.36 | 1.40 | 114 |
| W YELLOWSTONE | 0.38 | 0.90 | -0.52 | 42 | 20.04 | 21.17 | -1.13 | 95 |
| WISDOM | 0.15 | 0.63 | -0.48 | 24 | 10.23 | 11.54 | -1.31 | 89 |



Precipitation Totals

September and Water Year 2006

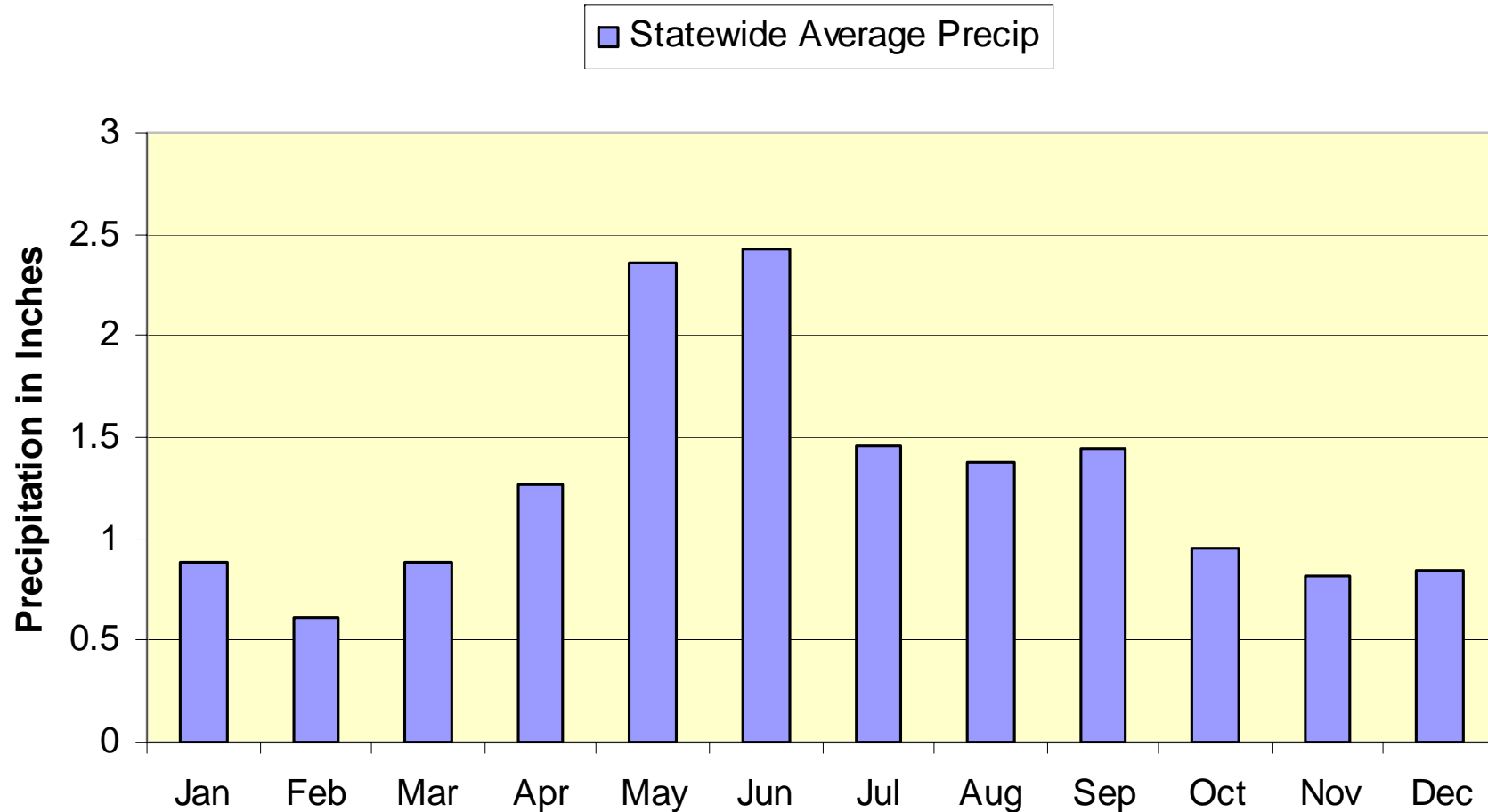
| | SEPTEMBER 1 - 18 | | | | WATER YEAR TO DATE | | | |
|------------------------|------------------|--------------|-------------|--------------|--------------------|--------------|-------------|--------------|
| | ACTUAL PCPN | NRML PCPN | +/- NRML | % OF NRML | ACTUAL PCPN | NRML PCPN | +/- NRML | % OF NRML |
| CENTRAL MONTANA | | | | | | | | |
| BILLINGS | 1.92 | 0.74 | 1.18 | 259 | 12.46 | 14.09 | -1.63 | 88 |
| CASCADE 20 SSE | 1.05 | 0.90 | 0.15 | 117 | 15.40 | 13.86 | 1.54 | 111 |
| CHINOOK | 0.74 | 0.90 | -0.16 | 82 | 10.37 | 12.53 | -2.16 | 83 |
| CHOTEAU | 0.72 | 0.65 | 0.07 | 111 | 11.78 | 10.27 | 1.51 | 115 |
| CUT BANK | 0.28 | 0.81 | -0.53 | 35 | 4.35 | 12.14 | -7.79 | 36 |
| FORT ASSINNIBOINE | 1.01 | 0.75 | 0.26 | 135 | 9.40 | 12.54 | -3.14 | 75 |
| FORT BENTON | 0.93 | 0.79 | 0.14 | 118 | 14.36 | 13.25 | 1.11 | 108 |
| GOLD BUTTE 7 N | 0.81 | 0.96 | -0.15 | 84 | 11.98 | 13.19 | -1.21 | 91 |
| GRASS RANGE | 1.27 | 0.79 | 0.48 | 161 | 16.67 | 16.03 | 0.64 | 104 |
| GREAT FALLS | 1.54 | 0.78 | 0.76 | 197 | 18.38 | 14.49 | 3.89 | 127 |
| HARLEM | 1.41 | 0.85 | 0.56 | 166 | 13.13 | 11.03 | 2.10 | 119 |
| HAVRE | 0.93 | 0.67 | 0.26 | 139 | 9.11 | 11.10 | -1.99 | 82 |
| LIVINGSTON | 0.66 | 0.90 | -0.24 | 73 | 12.87 | 15.15 | -2.28 | 85 |
| LEWISTOWN | 1.52 | 0.90 | 0.62 | 169 | 17.17 | 17.37 | -0.20 | 99 |
| MARTINDALE 3 NNW | 0.88 | 0.77 | 0.11 | 114 | 12.43 | 13.15 | -0.72 | 95 |
| NEIHART 8 NNW | 0.00 | 1.26 | -1.26 | 0 | 17.19 | 20.70 | -3.51 | 83 |
| SHELBY | 0.91 | 0.61 | 0.30 | 149 | 8.93 | 9.23 | -0.30 | 97 |
| STANFORD | 1.07 | 0.93 | 0.14 | 115 | 16.34 | 16.60 | -0.26 | 98 |
| SWEET GRASS | 0.85 | 0.98 | -0.13 | 87 | 12.38 | 14.18 | -1.80 | 87 |
| VALIER | 1.14 | 0.78 | 0.36 | 146 | 12.38 | 11.94 | 0.44 | 104 |
| WHITE SULPHUR SPRGS | 0.45 | 0.75 | -0.30 | 60 | 12.85 | 12.74 | 0.11 | 101 |
| EASTERN MONTANA | | | | | | | | |
| GLASGOW | 1.28 | 0.62 | 0.66 | 206 | 9.06 | 10.89 | -1.83 | 83 |
| MILES CITY | 0.70 | 0.71 | -0.01 | 99 | 11.82 | 12.98 | -1.16 | 91 |
| WILLISTON | 0.55 | 0.87 | -0.32 | 63 | 12.18 | 13.68 | -1.50 | 89 |



Statewide Average Precipitation

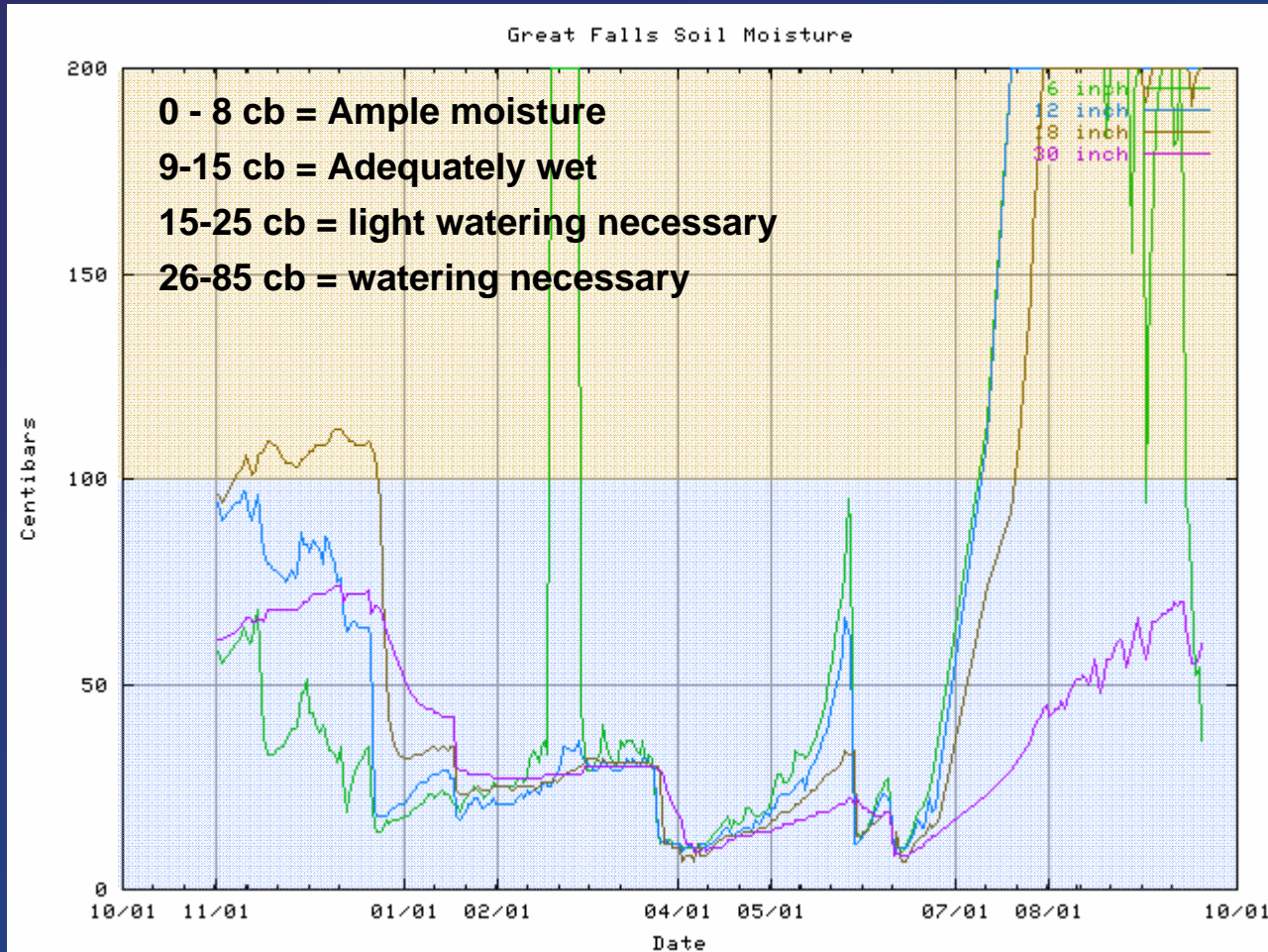
September mostly stratiform precipitation

Better chance for widespread relief





Great Falls Soil Moisture



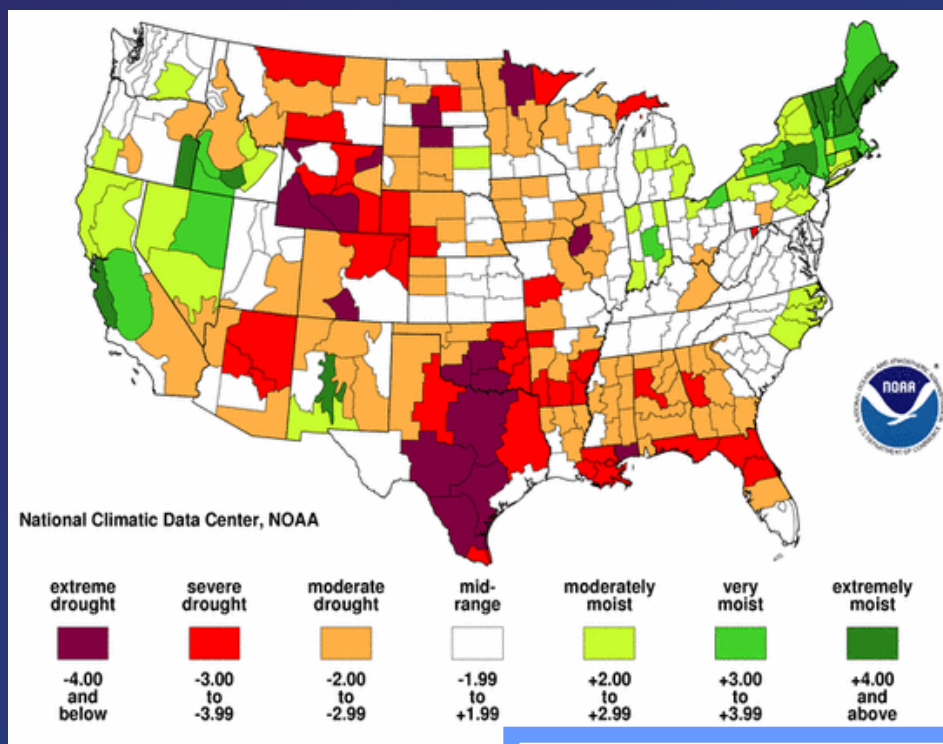
- Nice response at 6" to rain from storm last weekend
- No response at 12" or 18"
- Brief response at 30"
 - Horizontal movement through shale layer?

6" = 37 cb
12" = 200 cb
18" = 200 cb
30" = 62 cb



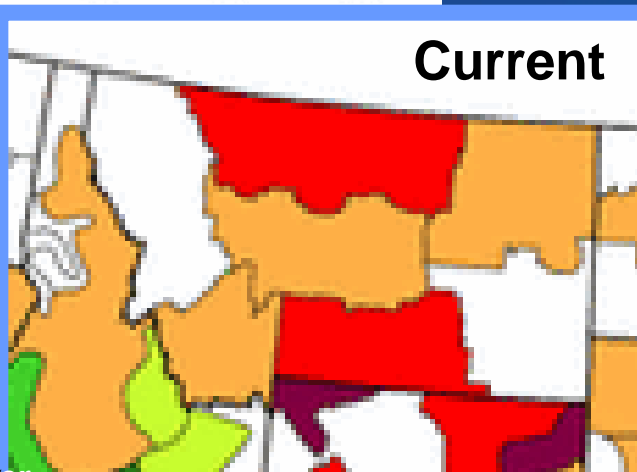
Palmer Hydrological Drought Index

August 2006

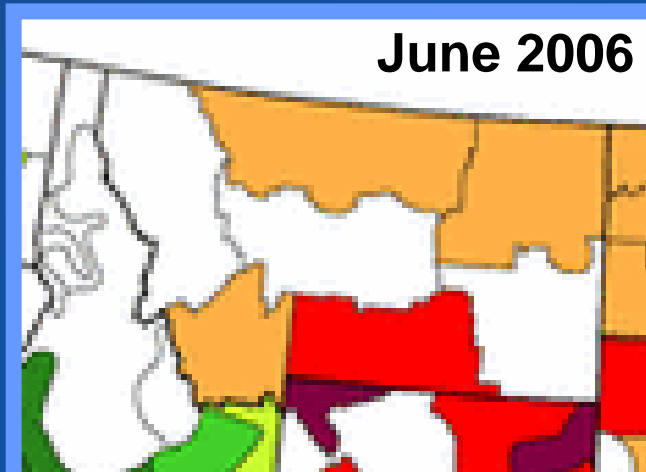


- 2 climate divisions dropped a category
 - North central degraded from 'Moderate' to 'Severe'
 - Central dropped from 'Mid-Range' to 'Moderate' Drought
- Two climate divisions hanging on to 'Mid-Range'
 - West and southeast

Current



June 2006

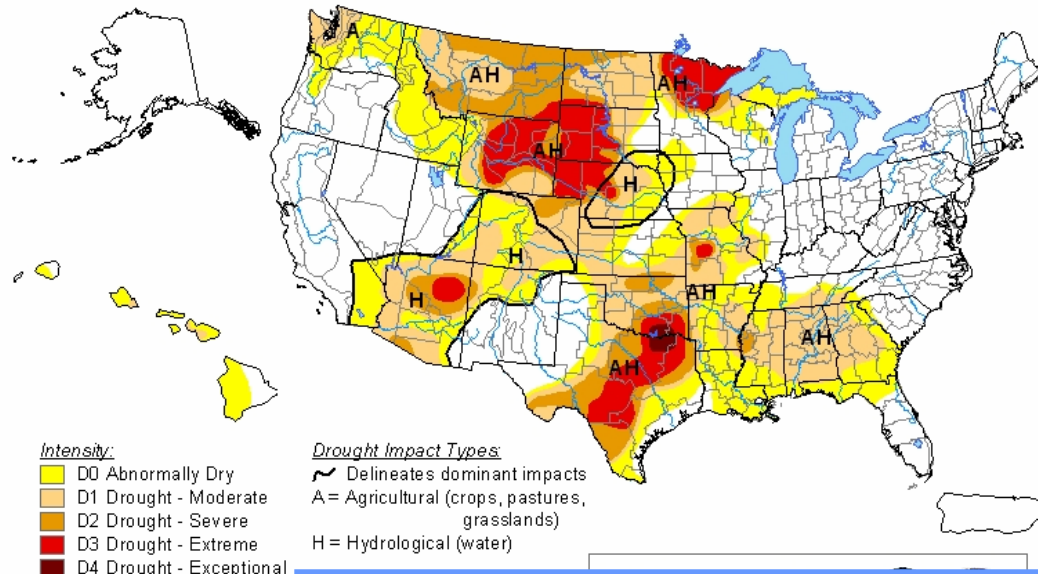




National Drought Monitor

September 19, 2006

U.S. Drought Monitor September 19, 2006 Valid 8 a.m. EDT

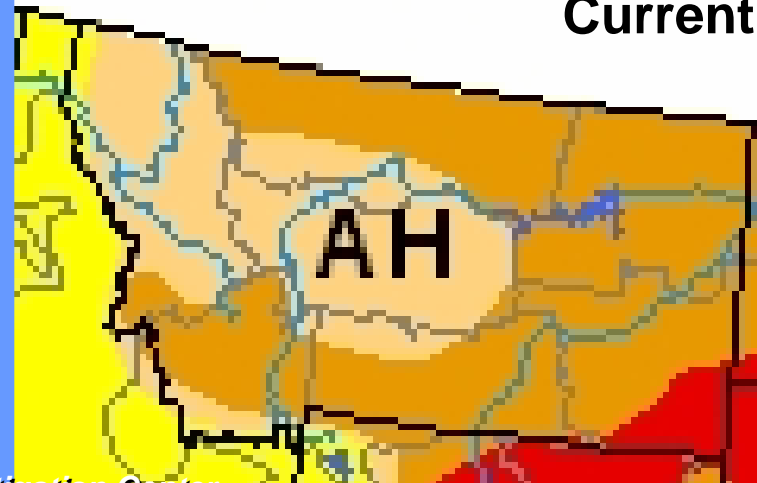


The Drought Monitor focuses on local conditions. Local conditions may vary. See the Drought Monitor website for forecast statements.

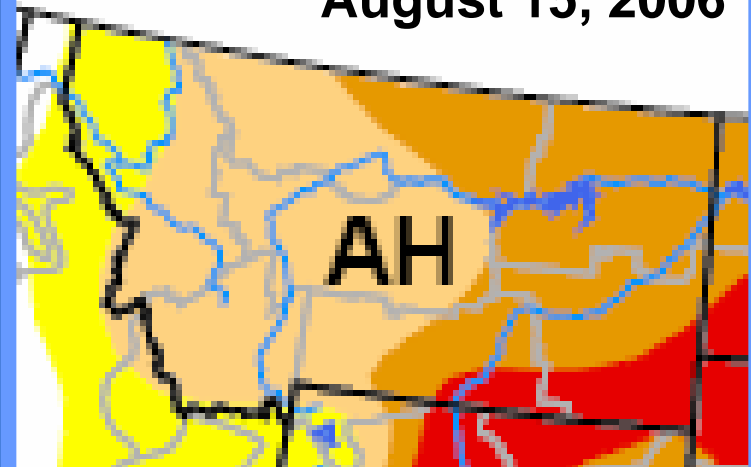
<http://droughtmonitor.noaa.gov>

- Continued expansion of drought categories across Montana
- All of Montana in at least 'Moderate' (D1)
- North, east and south in 'Severe' to 'Extreme' (D2 and D3)

Current



August 15, 2006





National Drought Monitor

Regional and State Views

[Drought Monitor](#) [Forecasts](#) [What's New](#) [Current Conditions](#) [About Us](#) [Archive](#) [Contact Us](#) [Links](#) [Home](#)

The data cutoff for Drought Monitor maps is Tuesday at 7 a.m. Eastern Standard Time. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

New Feature! Drought Monitor

Return to [U.S. Drought Monitor](#)

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U.S. Drought Monitor

September 12, 2006
Valid 8 a.m. EST

Return to [U.S. Drought Monitor](#) Return to [Region](#)

U.S. Drought Monitor
Montana

Drought Conditions (Percent Area)

| | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 | None |
|------------------------------------|-------|-------|-------|-------|-----|------|
| Current | 100.0 | 91.0 | 44.5 | 9.7 | 0.0 | 0.0 |
| Last Week (9/5/2006 map) | 100.0 | 91.0 | 44.5 | 9.5 | 0.0 | 0.0 |
| Year to Date (1/3/2006 map) | 33.6 | 11.9 | 0.0 | 0.0 | 0.0 | 66.4 |
| Water Year to Date (10/4/2005 map) | 96.1 | 42.2 | 10.1 | 0.0 | 0.0 | 3.9 |
| One Year Ago (9/13/2005 map) | 95.9 | 42.4 | 14.3 | 0.0 | 0.0 | 4.1 |

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

[http://drought.](#)

For a pdf version of the map, click here: [http://drought.gov/pdfs/USDM_060912.pdf](#)

To view tabular statistics, click here: [http://drought.gov/statistics/USDM_060912.pdf](#)

For more information on drought, click here: [http://drought.gov/](#)

For local details and information, click here: [http://drought.gov/](#)

[Done](#)

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U.S. Drought Monitor

September 12, 2006
Valid 8 a.m. EST

Return to [U.S. Drought Monitor](#) Return to [Region](#)

U.S. Drought Monitor
Montana

Drought Conditions (Percent Area)

| | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 | None |
|------------------------------------|-------|-------|-------|-------|-----|------|
| Current | 100.0 | 91.0 | 44.5 | 9.7 | 0.0 | 0.0 |
| Last Week (9/5/2006 map) | 100.0 | 91.0 | 44.5 | 9.5 | 0.0 | 0.0 |
| Year to Date (1/3/2006 map) | 33.6 | 11.9 | 0.0 | 0.0 | 0.0 | 66.4 |
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| One Year Ago (9/13/2005 map) | 95.9 | 42.4 | 14.3 | 0.0 | 0.0 | 4.1 |

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U.S. Drought Monitor

September 12, 2006
Valid 8 a.m. EST

Return to [U.S. Drought Monitor](#) Return to [Region](#)

U.S. Drought Monitor
Montana

Drought Conditions (Percent Area)

| | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 | None |
|------------------------------------|-------|-------|-------|-------|-----|------|
| Current | 100.0 | 91.0 | 44.5 | 9.7 | 0.0 | 0.0 |
| Last Week (9/5/2006 map) | 100.0 | 91.0 | 44.5 | 9.5 | 0.0 | 0.0 |
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Intensity:

- D0 Abnormally Dry
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- D4 Drought - Exceptional

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[Done](#)

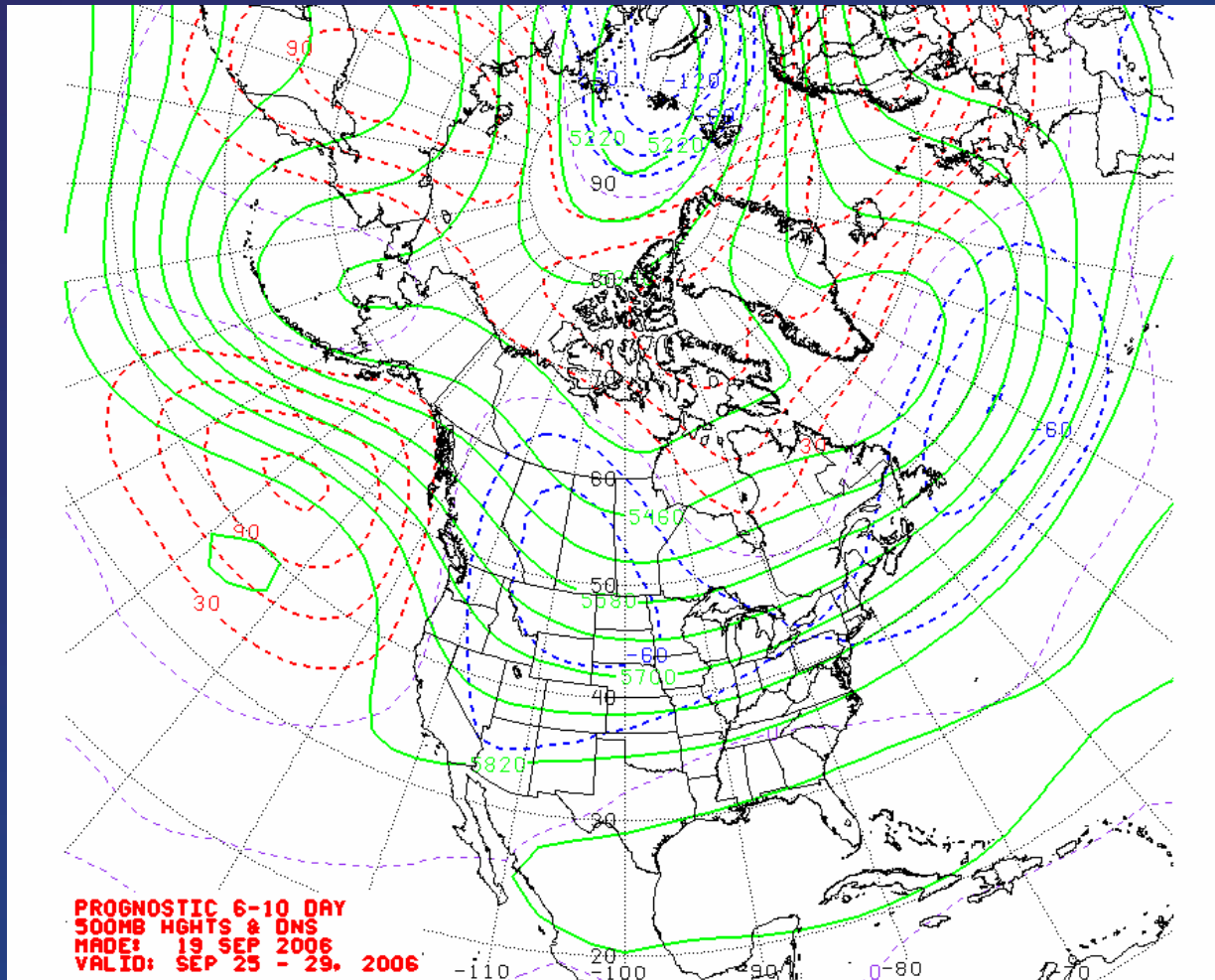


Released Thursday, September 14, 2006



6 to 10 Day Outlook

500mb Heights and Anomalies



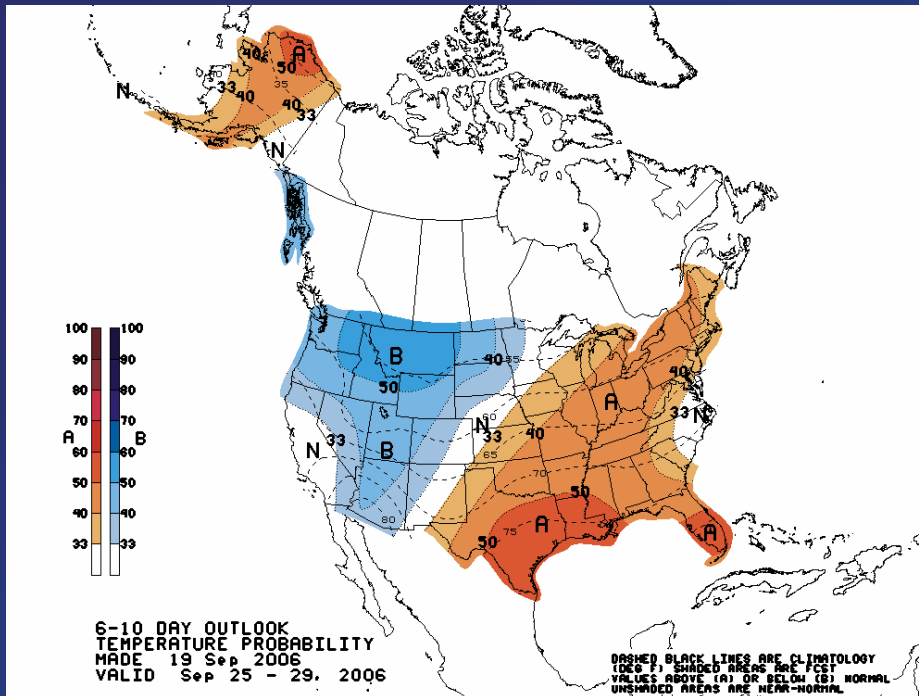
- September 25-29
- Low pressure trough over much of U.S.
- High pressure ridge to the west
- North to northwest flow
- Temperatures below seasonal normals
- Chance of precipitation



6 to 10 Day Outlook

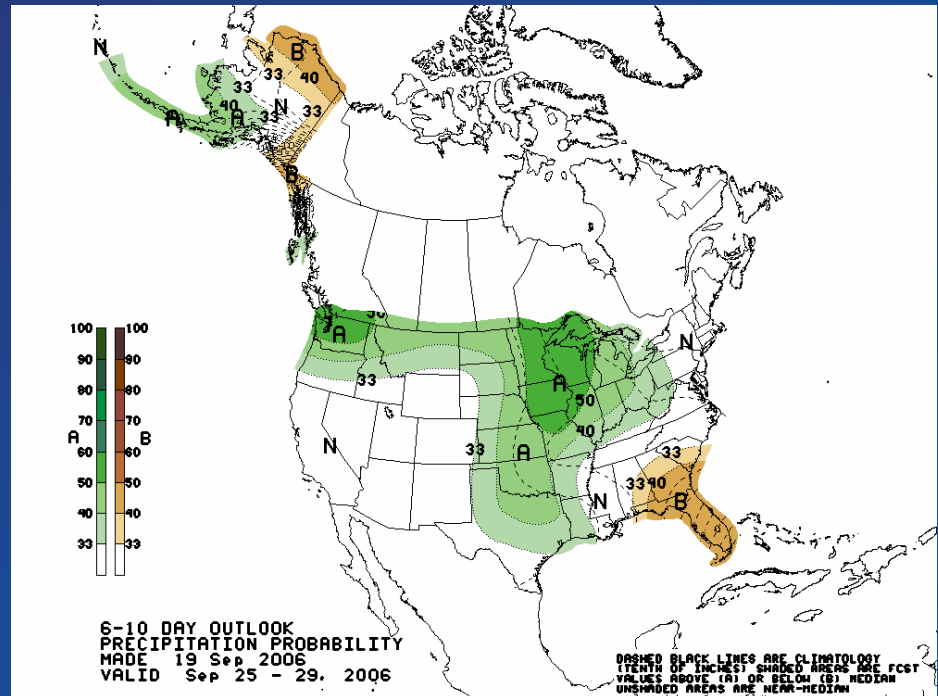
September 25 - 29

Temperature



- 50% to 60% chance for below normal temperatures across Montana

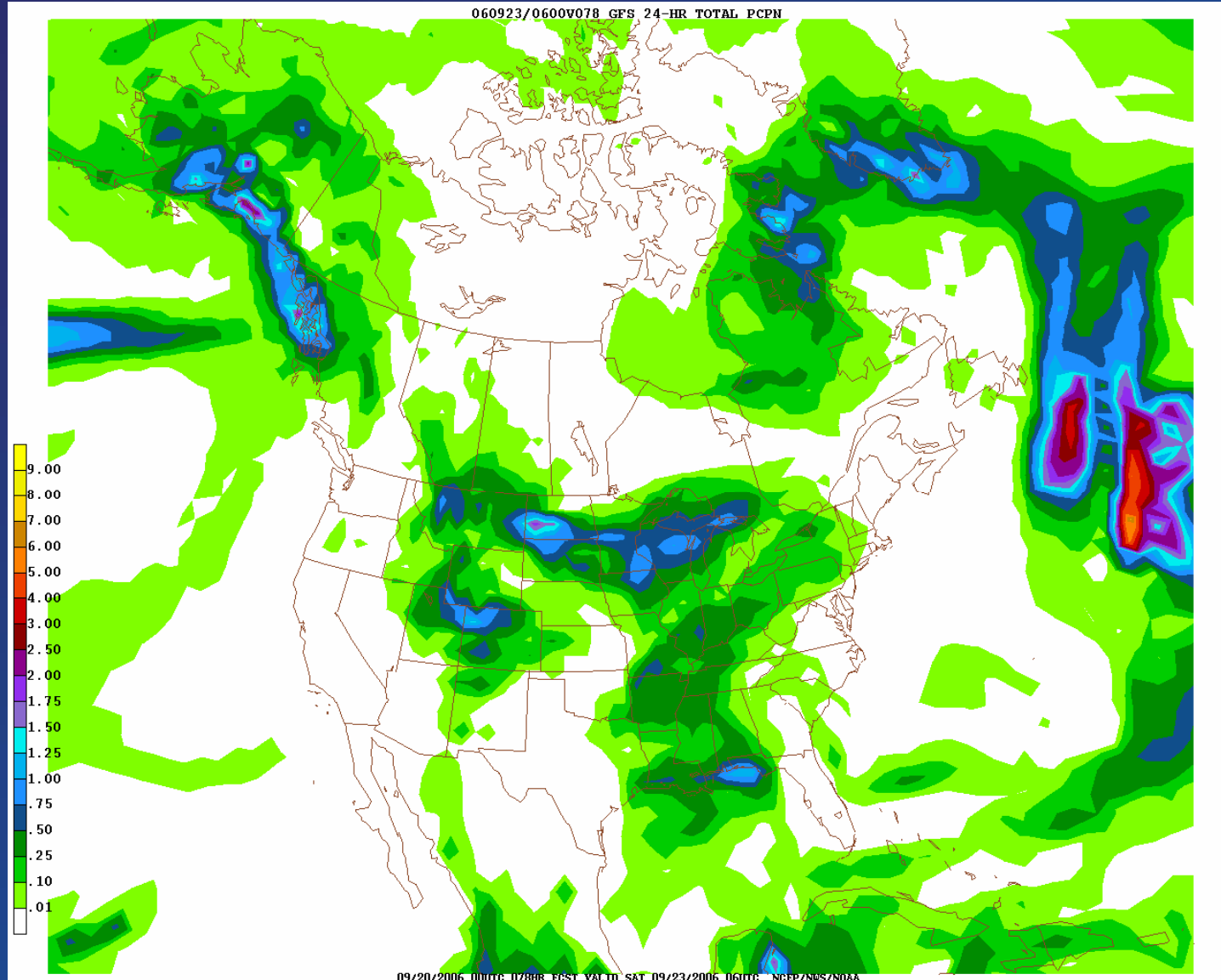
Precipitation



- 33% to 50% chance for above normal precipitation across Montana

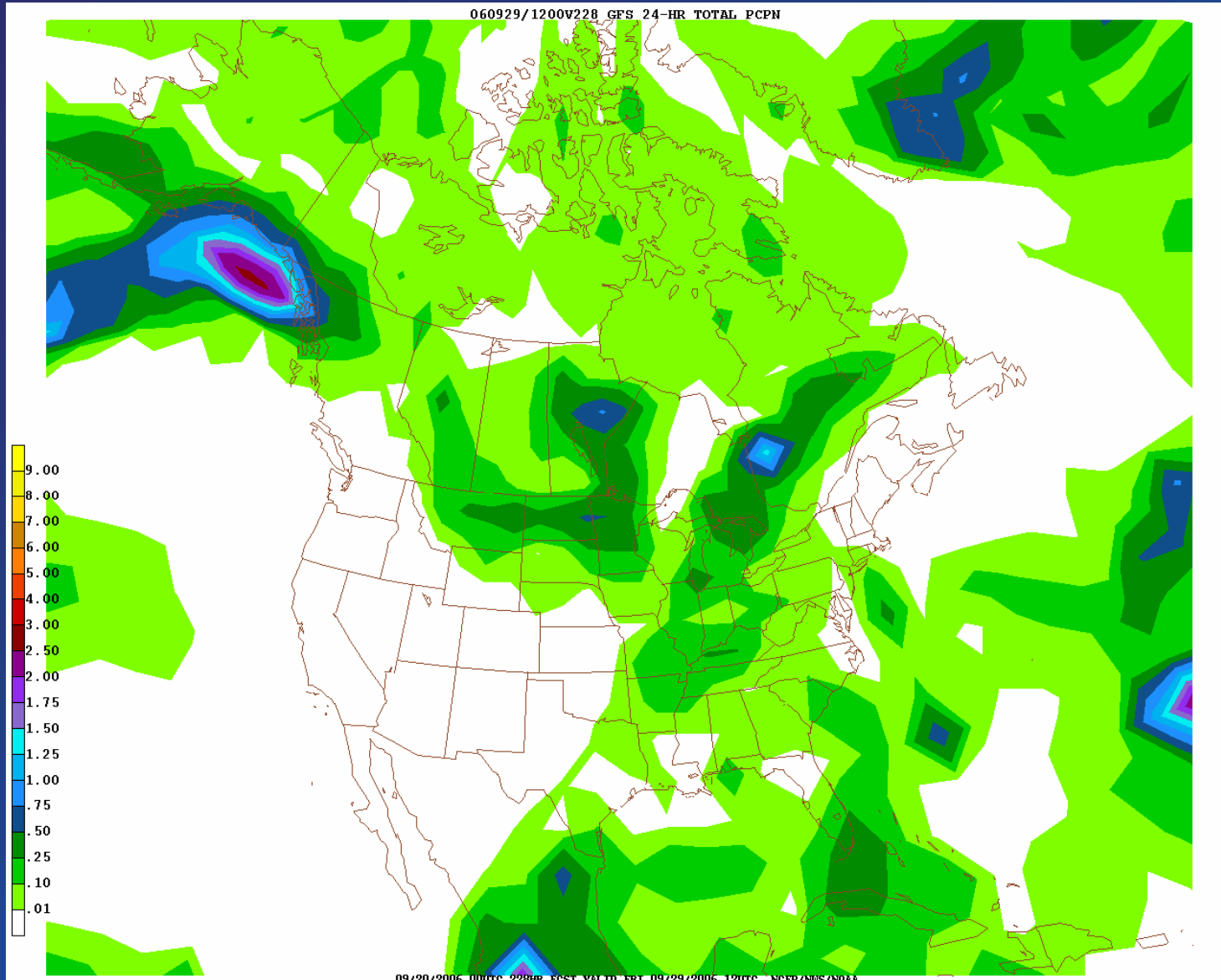


24-hour Precipitation Forecast September 23





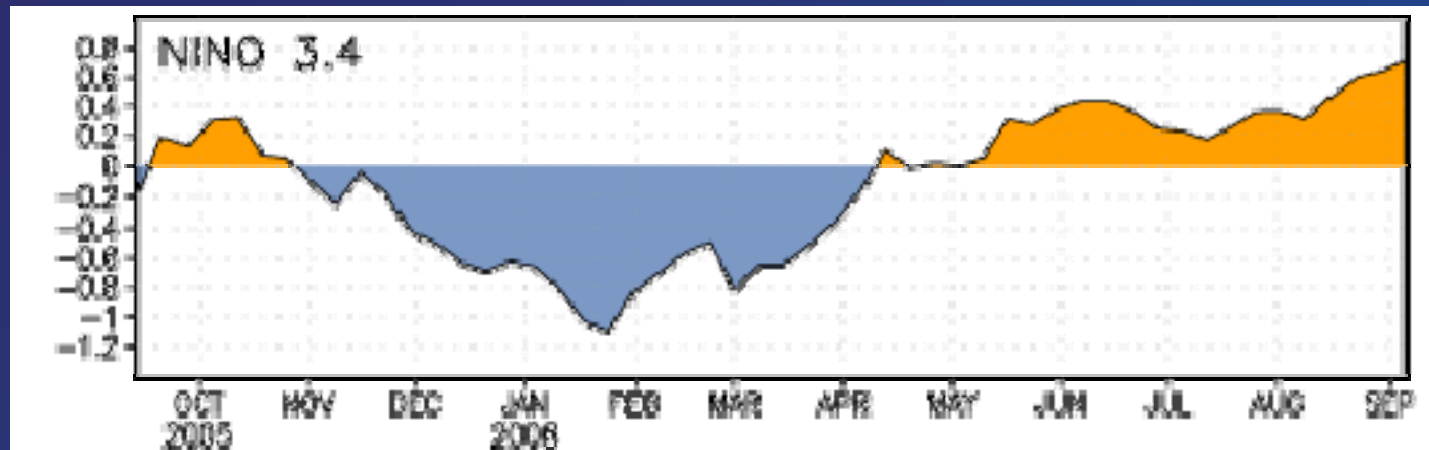
24-hour Precipitation Forecast September 29



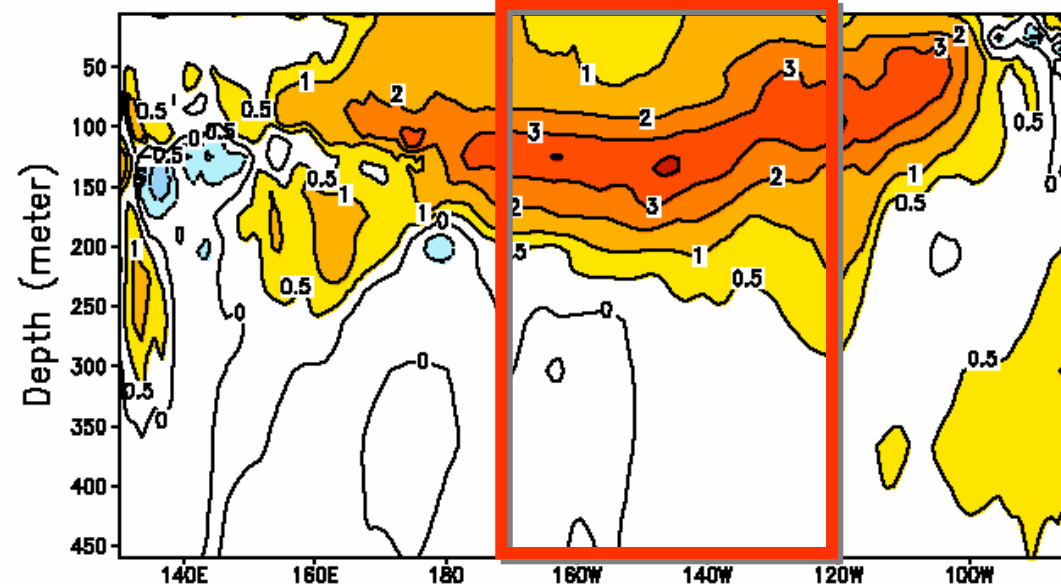


Current Status of El Niño/La Niña

El Niño conditions have developed
Likely to continue into early 2007



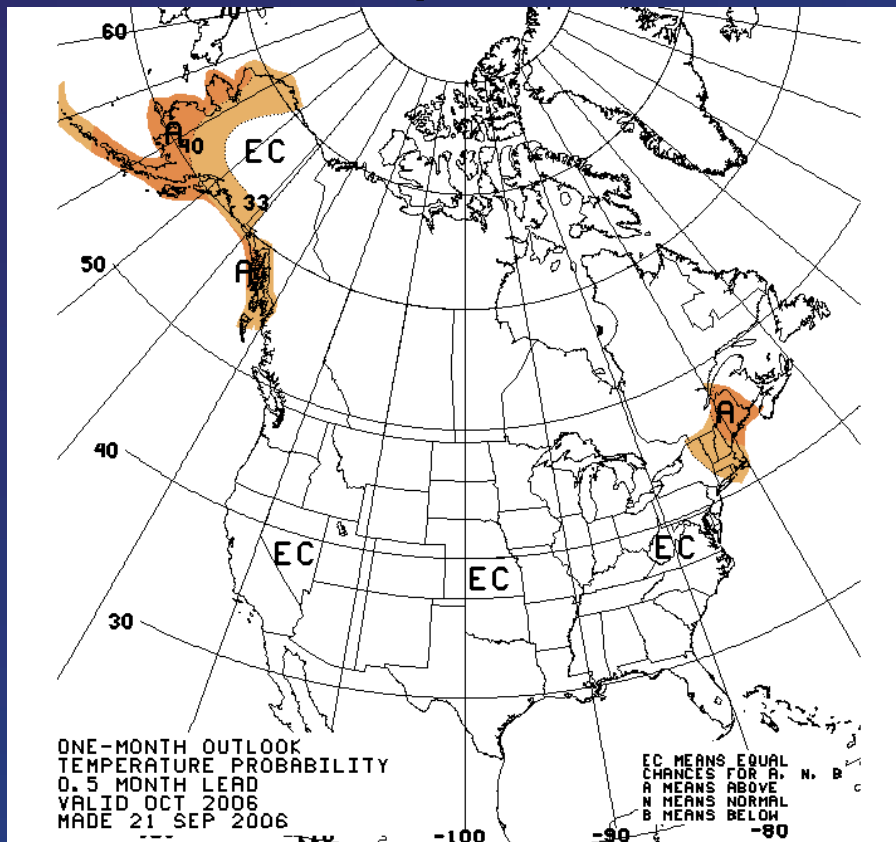
Equatorial Temperature Anom (°C), Sep 05 2006





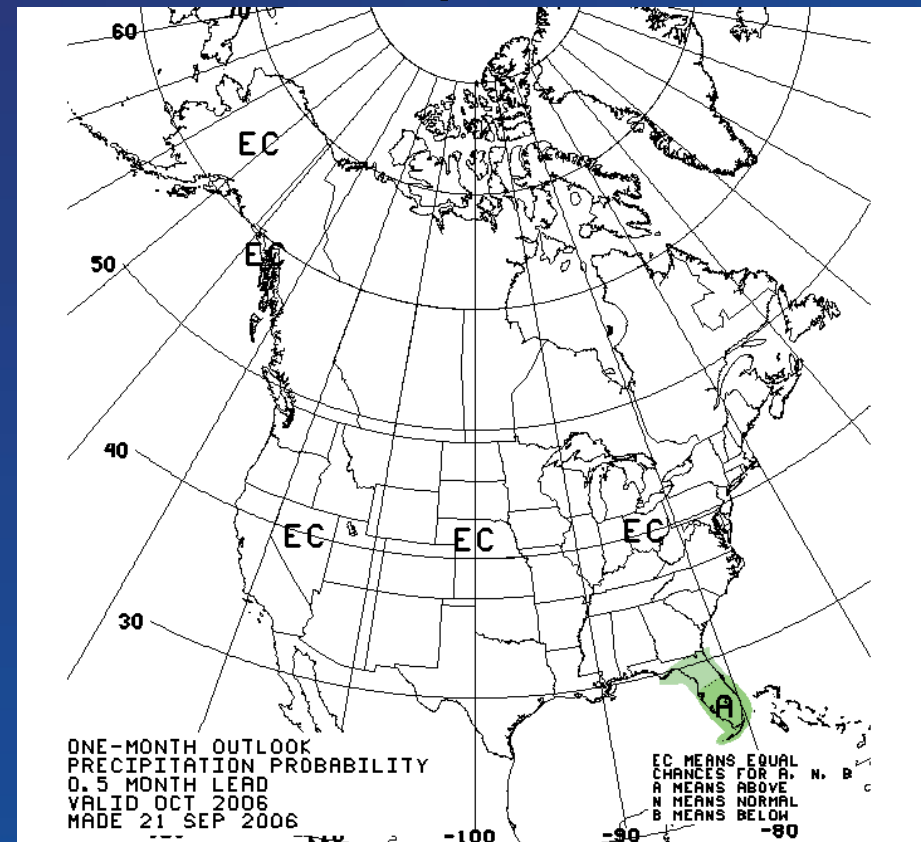
October Outlook

Temperature



- All of Montana – No forecast skill
 - *Equal chances for above... below or near normal temperatures*
 - *Normals for October*
 - Highs in the upper 50s to lower 60s
 - Lows in the upper 20s to lower 30s

Precipitation

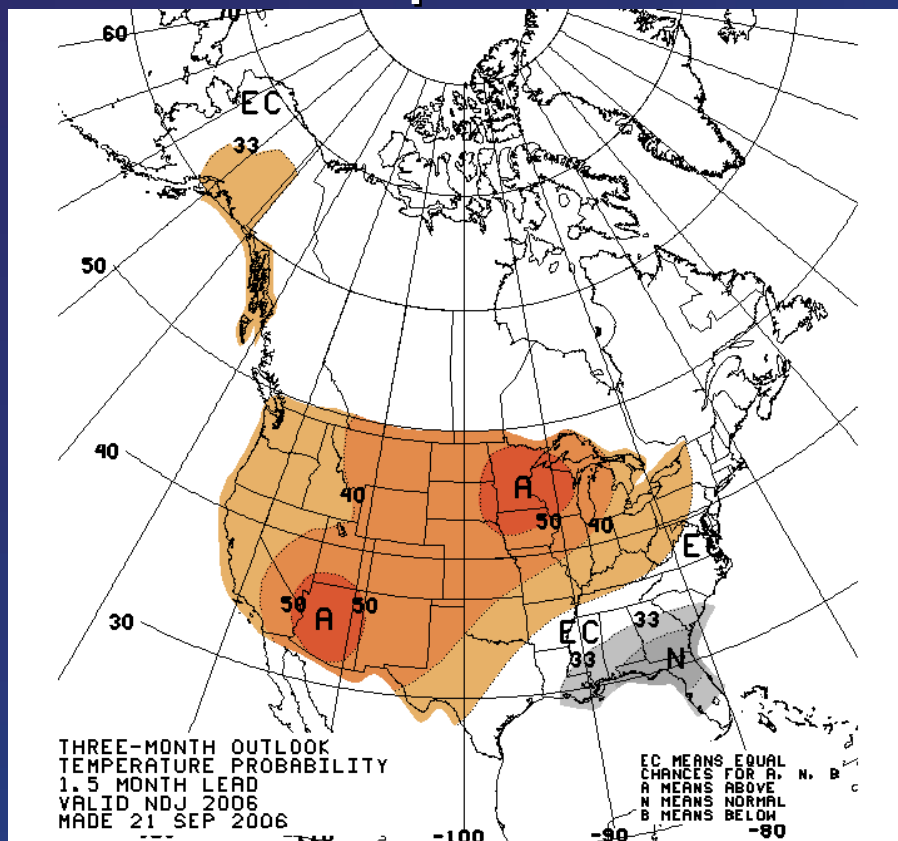


- All of Montana – No forecast skill
 - *Equal chances of above... below or near normal precipitation*
 - *Normals for October*
 - 0.50" to 1.00"



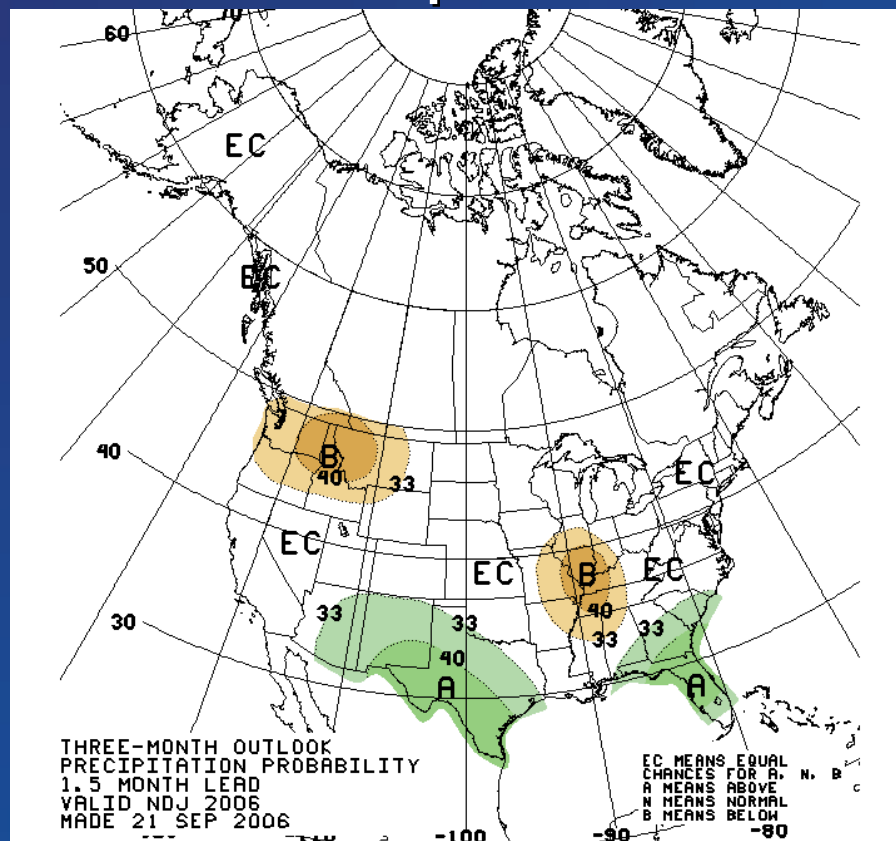
November – January Outlook

Temperature



- Extreme west – 33% to 40% chance of above normal temperatures
- Remainder of Montana – 40% to 50% chance of above normal temperatures

Precipitation

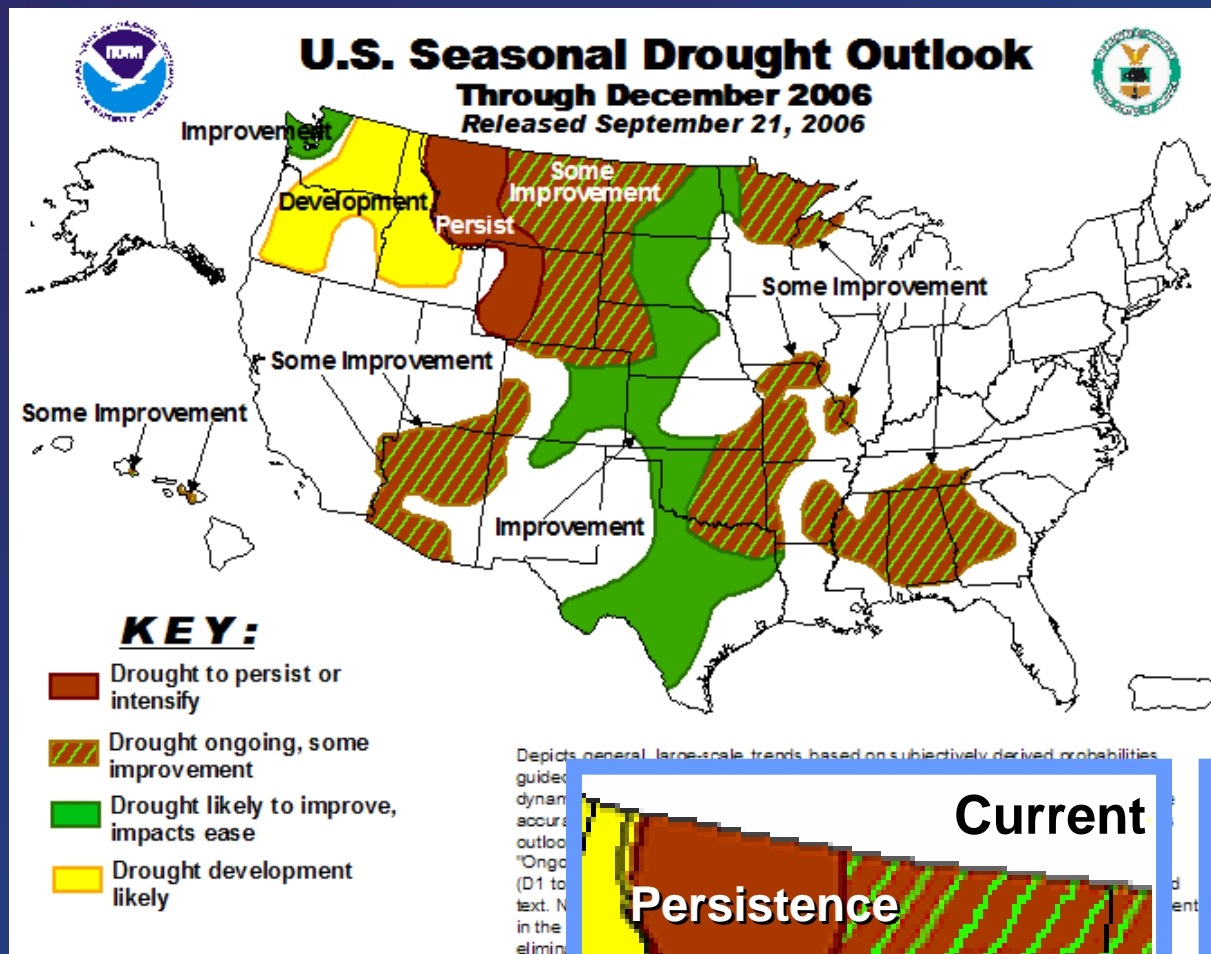


- West – 40% to 50% chance of above normal precipitation
- Central – 33% to 40% chance of above normal precipitation
- East – No forecast skill
 - Equal chances for above... below or near normal precipitation

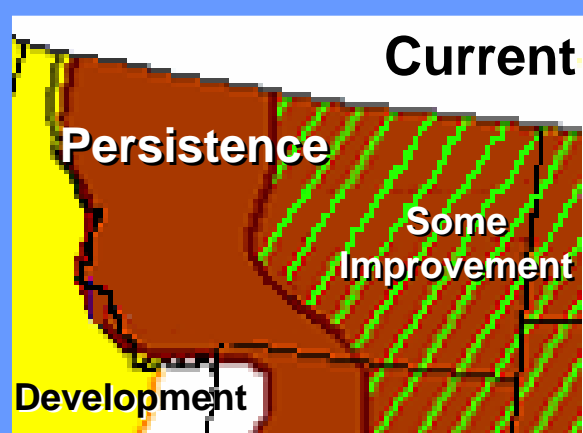


Drought Outlook through December

Issued September 21, 2006



- Persistence expected over western Montana
- Some improvement expected east





In Summary...

- 💧 August continue warm, dry trend
- 💧 Summer season averaged hot and dry for Montana
 - *Drought conditions worsened statewide*
- 💧 Water year precipitation still near normal over most of state
 - *Areas below normal continue to slowly expand*
- 💧 Crop Year moisture lacking
 - *Most of state below to well below normal*
- 💧 September precipitation bringing some relief
- 💧 Continued chances for precipitation for about the next week



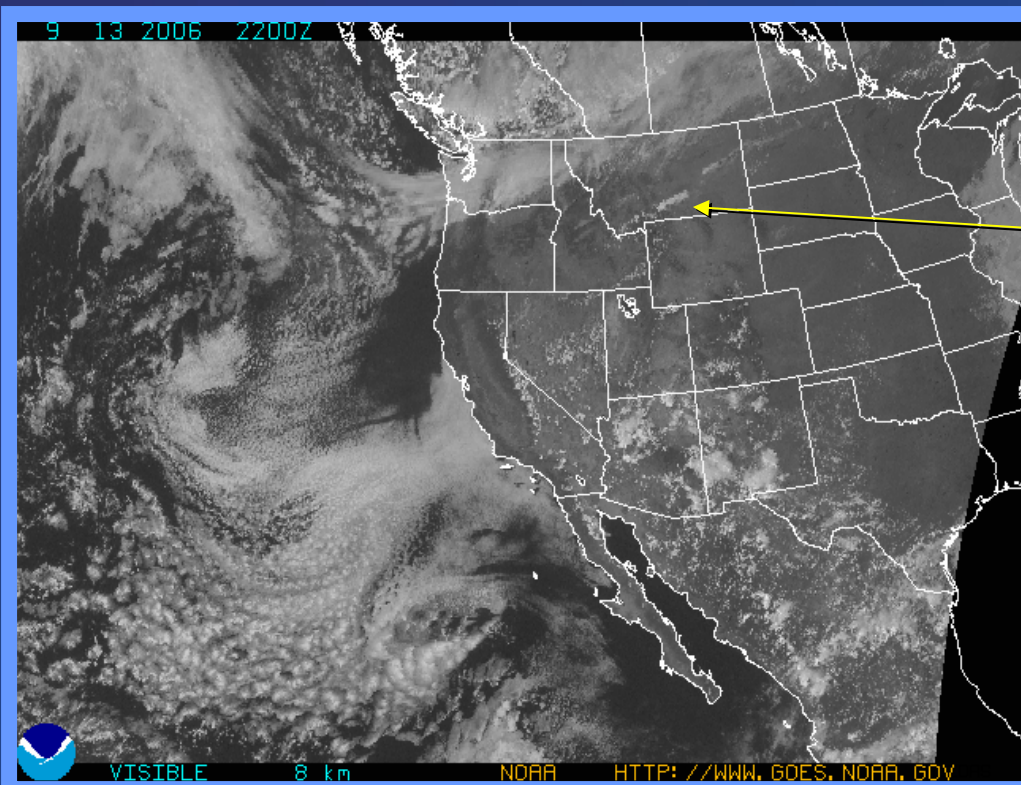
weather.gov

weather.gov/billings

weather.gov/glasgow

weather.gov/missoula

weather.gov/greatfalls



Smoke plume from Jungle Fire
September 13, 2006